

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.

























# SOIL CONSERVATION

Index

VOLUME XXX

August 1964 to July 1965

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

MAR 30 1966

CURRENT SERIAL RECORDS



UNITED STATES DEPARTMENT OF AGRICULTURE

Issued March 1966

UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

SOIL CONSERVATION—INDEX TO VOLUME XXX

AUGUST 1964 TO JULY 1965

	Page		Page
ACHTERMANN, ADRIAN: Ohio Agency Gives Wildlife Award.....	185	Alabama—	
Act(s)—		Appalachia.....	221
Appalachian Regional Development.....	221	club and district sponsor Soil Stewardship-Week.....	226
Economic Opportunity.....	189	Greene County SCD conducts "Know Your Soil" campaign.....	256
Food and Agriculture 1962 gave USDA responsibility for Resource Conservation and Development projects.....	127	springs and seeps answer to water supply problem.....	96
Land and Water Conservation Fund for public and private land for recreation.....	161-162	Alaska—	
Town Conservation Commissions (Mass.).....	27	Agriculture, a Shock to. William B. Oliver..	30-31
Adams, Lonnie, developing floodwater spreading systems (Mont.).....	261	homesteading and agriculture.....	33
Adams, Marmion and Dave, practice reduced tillage (Iowa).....	105	Algeria—	
Agency for International Development—		operations by SCS, 1964.....	140
administers and coordinates programs.....	3	SCS applies simple conservation practices in .....	4
contractual agreement with SCS.....	140	SCS assisting government programs.....	3
Agricultural Research Service—		ALLAN, DAVID N.: Many New Landowners and Farmers Plant Shrubs for Wildlife.....	183-184
research specialist, Tunisia.....	4	American Forestry—	
wind erosion equation.....	107-108	Association Sponsors Multiple Use Conservation. Kenneth B. Pomeroy.....	67
Agricultural Stabilization and Conservation Service—		Conservation Program.....	71
assisting in Rural Areas Development Program (Ark.).....	13	Conservation Program policy statement.....	51
committee, emergency cost-sharing practices for debris removal (Alaska).....	31	ANDERSON, R. D.: Pleasure and Profit From Ranch Resources. With Willis Hammond and Richard Porter.....	240
cost-shared costly drainage (Ohio).....	14	Animal-Unit Leases Help Balance Grazing on Pilot Rock Range. Edgar Baumann and Bud Lemmons.....	209-210
cost-sharing assistance (Colo.).....	96	annual report of Soil Conservation Service, 1964.....	133-140
Granted additional money to projects for landowners needing water (Ohio).....	66	Appalachia—	
helped finance irrigation (N. Mex.).....	131	A Look at.....	267
increased cost-share rate for adapted varieties of grass.....	58	a trouble spot.....	244
participates in RC&D project activities.....	127	Action in.....	221-223
provided special help for farmers, Clark Fork (Mont.).....	59	The Challenge of. D. A. Williams.....	263
shared cost of improving woodlot (Ohio).....	280	In Perspective. Glendon P. Burton and Ross Mellinger.....	271-273
sponsors tree-planting practice (Tenn.).....	251	Its Problems. Robert H. Marcum..	268-269, 282-283
Agriculture, Department of, co-partners in river basin planning.....	136	The Program. Robert W. Oertel.....	270-271
agronomy, progress in 1964.....	139	Area Redevelopment Administration loaned for Lewisburg water supply.....	10
AHERN, MAURICE E.: Grasses Used in Crop-land Shifts.....	235	Arizona—	
airplane used to spray sagebrush (Utah).....	144	Annual Youth Conservation Camp.....	175-176
Airport Conservation Makes Good Neighbors. Bernhard A. Roth.....	36-39	Lehmann lovegrass.....	6
		Migrant Ministry enlisting people into programs to obtain equal economic opportunity.....	220



	Page		Page
Arkansas—		Belknap, Burton, nature trail (N.Y.)-----	177
Broadens District Powers-----	258	BELL, DONALD W.: Scouts Serve Community, Earn Badges by Helping Install Watershed Project -----	211
district sponsored essay contests-----	42	Bell, Harry W.: Sediment Threat Stirs Landowners. With Richard D. Jiskra-----	68
11th National Watershed Congress held in Little Rock-----	9	BERG, NORMAN A.: Great Plains Conservation Meets a Regional Problem-----	248-250
Six-Mile Creek watershed reduced cropland-----	196	Bicolor Guards Rights-of-way-----	11
Sunset Community Rural Areas Develop- ment-----	12	Bidenharn, Bernard and Betty, pump Rocky Fork Branch (La.)-----	254
Army, Department of—		BILLINGS, WILLIAM H.: Nursery Alternates Trees and Cattle in Same Fields. With B. H. Rountree-----	116
co-partner in river basin planning-----	136	Biology, progress in 1964-----	139
ATKINS, M. D.: The Search for "Ecotypes"---	58	BOEKING, R. H.: SCD Buys and Restores Farm to Demonstrate Good Practices-----	234-235
Award(s)—		BOLLMAN, ROBERT V.: Chisel Plow Reduces Erosion. With Ernest E. Behn-----	105
FFA won by Robert Hendershot (Ohio)---	141	BOWEN, RICHARD B.: Northern Rio Grande RC&D Project Awakens Area-----	131-132
New, Program Supports 4-H Club Conserva- tion Project. E. J. Williamson-----	81	Boy Scout(s)—	
Study Area Wins SCSA Merit-----	81	Get Conservation Lessons. John M. Cross--	189
USDA Council Conservation Award to De- troit Area Council, Scouts-----	17	National Council Hornaday Award-----	19
Wildlife Conservation Award given to Lyn Newnham (Ohio)-----	185	Serve Community, Earn Badges by Helping Install Watershed Project. Donald W. Bell -----	211
William T. Hornaday Award to Eagle Scout Jeff Harms (S. Dak.)-----	19	Sixth National Jamboree at Valley Forge---	84
Aycock, John, full-time conservation farmer since retired from SCS (Tenn.)-----	285	use old Christmas trees to control soil and water losses (Mont.)-----	154
BAILEY, GEORGE E.: More and Better Grass Pays in Great Plains. With Carl S. Fonte--	168	Brady's Hills Ski Area. James M. Cooper and Merrill D. Ray-----	55-57
bargraph on conservation photo (Pa.) repre- sents extent of four major conservation problems. Cover picture-----	[242]	BRIGGS, SHIRLEY A.: Natural History So- cieties. With John Vosburgh-----	92-93
BARNARD, JOHN W.—		BROWN, GEORGE S.: Solving Playground Prob- lems Part of District Program-----	39-40
Opportunities in Resource Development----	127-128	BROWN, LEO: Bluestem Grass in a Black Wrapper. With Sy Ekart-----	186
Review of "Planning Our Town"-----	214	BROWN, SILAS W.: Trees Planted on Shaft Mining Land-----	154
BATHURST, VERNE M.: Soil Erosion in Urban Areas-----	274-275	BROWN, WILLIAM F.: Agencies, Landowners Join Efforts to Improve Ditch. With Richard W. Rush-----	14
BATTLES, JOHN: Plow-Planting for Fewest Trips -----	105	Brush Control—	
BAUMANN, EDGAR: Animal-Unit Leases Help Balance Grazing on Pilot Rock Range. With Bud Lemmons-----	209-210	by mechanical and chemical methods (Tex.)-----	150-152
Beautification—		most widespread practice applied with cost- sharing assistance-----	250
and recreation on Rocky Ford Branch (La.)-----	254	BURTON, GLENDON P.: A Look at Appalachia in Perspective. With Ross Mellinger-----	271-273
in Appalachia (W. Va.)-----	273	Busse, Mel, constructed a lake and golf course (Wis.) -----	212
Beauty—		California—	
and Conservation. Lyndon B. Johnson and Orville L. Freeman-----	213-214	Central Sonoma watershed had special pro- visions for fish-----	173
new landowners (N.H.) think plants are a thing of-----	183	Goars tall fescue, Los Banos trefoil-----	6
picture story illustrating parts of White House Message on Natural-----	227-230	Monterey pines for Christmas trees-----	117
Preservation of Natural. Gladwin E. Young -----	165	orchardist came up with a golf course-----	32
Roadside, and Safety. L. D. Eagles and O. S. Kirkpatrick -----	111-112	Plant Center gave Lana its name-----	152
rural -----	95	Cameron, J. B., and Jim, scheduled grass seed- ing (Kans.)-----	284
Russian-olive for many kinds of landscape plantings-----	231		
windbreaks planted by farmers and ranchers along interstate highway (N. Dak.)-----	225		
Behind the Scenes on a Watershed Construc- tion Job. Paul E. Nylander-----	202-206		
BEHN, ERNEST E.: Chisel Plow Reduces Erosion. With Robert V. Bollman-----	105		

	Page		Page
Camp Conservation Wins Scout Council Award .....	17-18	Conservation—Continued	
camp on conservation for young first-of-fenders (Mich.) .....	223	plan joint project between school and farmer (N.Y.) .....	39
Capital Residents Get Field Course in Natural History, conservation .....	45	Therapy. Donald D. Kline .....	223-224
Carlisle, Mahlon, woodland (Ohio) .....	280	Unified Planning. Benjamin Isgur .....	27-29, 45
Cattle—		Work Wins FFA Award. Pearl L. Fogle .....	141
Drive, A Modern. Dwaine C. Smith and Herbert R. Davis .....	155-158	Your Community and You .....	84-86
larger calves on animal-range leasing (Oreg.) .....	209	Conservationists All .....	19
on one side of nursery, trees on other .....	116	Conservation Needs Inventory—	
Center—		data from 1964 .....	140
nature, Ghost Ranch Museum (N. Mex.) .....	78-81	indicated foothill grazing land where Lana vetch can be used .....	8
Plains Conservation (Colo.) .....	81	points up problems facing SCS .....	243
Church in Resource Conservation and Development. Dr. Henry A. McCanna .....	219-220	proved woodland improvement being neglected by landowners (Ohio) .....	280
Civil Rights Act, Rural Beauty. D. A. Williams .....	95	showed the job still to be done in the Great Plains .....	269
CLAUSEN, ERLING W.: Outdoor Laboratory Builds Interest in All Studies .....	82-83	Shows Dimensions of the Job .....	245-247
Colorado—		Contractor(s)—	
earthmoving .....	96	digging channels in watershed (Minn.) .....	15
gradient ditches in Cedar Draw, Cataract Ditch .....	281	Help Speed Woodland Improvement in Northeastern Ohio. Paul A. Dodd .....	280
grass, water, wildlife contribute to success of ranch .....	240	on Holderman Ditch job (Ohio) .....	14
irrigated land leveled .....	42	COOPER, JAMES M.: Brady's Hills Ski Area. With Merrill D. Ray .....	55-57
Never Summer Ranch favorite spot for vacationers .....	202	COTTON, JAMES A.: Soil Display Boards Aid "Know Your Soil" Campaign. With Luther E. Gowder .....	256
pays to reseed submarginal cropland to grass .....	168	Coxe, Francis, of S. C., District Profile .....	21-22
State reformatory site of a unique irrigation system .....	188	CRATTY, ARTHUR H.: Icelandic State Park Makes Good Use of Watershed Lake .....	259
terraced and contoured field after a light snow .....	188	CROOK, A. G.: State Reformatory Is Site of Unique Pipeline .....	188
Tomichie Ranch demonstrates range rehabilitation on private and public land .....	159	Cropland(s)—	
West Arapahoe SCD received SCSA award .....	81	Conservation Program requires work on ecotypes .....	58
Yuma Pheasant Association .....	178	Conversion Program used to fullest extent in furthering RC&D objectives .....	128
Committee for coordinating fish and wildlife conservation .....	40	conversion progress, 1964 .....	134
Companies—		reduced by land use conversions .....	196
Georgia-Pacific Corp. benefited by per-animal range leasing (Oreg.) .....	209	CROSS, JOHN M.—	
Thorofare and Locust Island Meadows (N.J.) .....	179-182	Pampered Stream Responds With Beauty and Utility. With Jimmie Wyche .....	254
COMPTON, LAWRENCE V.—		Scouts Get Conservation Lessons .....	189
Review of "Tomorrow's Wilderness" .....	69	Crow Wing Canoe Trail .....	123-125
Review of "Wildlife Management and Conservation" .....	190	DALE, TOM: Review of Farmer's World. The Yearbook of Agriculture .....	118
condition classes for range .....	149	DAVIES, CHARLES E.: Conservation Makes a Showplace of Farm .....	96
Conservation—		DAVIS, HERBERT, R.: A Modern Cattle Drive. With Dwaine C. Smith .....	155-158
Design Tames the Old Cataract Ditch. Neal P. McKinstry .....	281-282	DAVISON, VERNE E.: Attract Birds and Other Wildlife to Rural Areas. With Roy A. Grizzell .....	88-89
Essay Winners .....	42	De Los, Mr. and Mrs., developed recreation ponds (Ill.) .....	16
Makes Showplace of Farm. Charles E. Davies .....	96	Delta District Cooperators Mechanize Sugarcane Planting .....	233
Plan Converts Cropland to Grass. Larry Van Berkum .....	236	diary of an SCS construction engineer .....	203-206
Plan for County Roadsides. George R. Peeples .....	163	DILLON, OLAN W., JR.: Russian-Olive Is Prize Landscape Plant in West .....	231-232



	Page		Page
District of Columbia—		Education—Continued	
urbanized downstream two-thirds of Rock		pond an outdoor laboratory (Ill.)-----	197
Creek watershed-----	275	school building exhibit show larger school	
Washington Examining Board-----	140	sites for outdoor-----	187
Ditch(es)—		EKART, SY: Bluestem Grass in a Black Wrap-	
Agencies, Landowners Join Efforts to Im-		per. With Leo Brown-----	186
prove. Richard W. Rush and William		Engineers, U.S. Corps of, closely assisted by	
Brown-----	14	Highway Department on highways-----	43
gradient in Cedar Draw, Cataract Ditch		engineering progress in 1964-----	140
(Colo.)-----	281	ENGLE, EDWIN P.: Rancher Makes Showplace	
DODD, PAUL A: Contractors Help Speed		on Private, Public Land. With John	
Woodland Improvement in Northeastern		O'Hayre-----	159
Ohio-----	280	Equipment—	
DOMPIER, LENN: Farm Pond Serves Fire		grain drill for pilot planting on highway--	111
Protection and Recreation-----	19	landscaper used to sod waterways (Maine)--	113
Drainage—		erosion problems exist in Appalachia (Ky.)--	269
ditch fiber glass matting (Mo.)-----	43		
Holderman outlet ditch problem solved		Farm—	
(Ohio)-----	14	demonstration, bought and restored by	
survey for Sunset Community (Ark.)-----	12	Scotts Bluffs District (Nebr.)-----	234-235
drought in Great Plains-----	248-250	Game—Conservation Districts—Wildlife for	
Duffin, Russ and Jack, pond outdoor labora-		Everyone. D. A. Williams-----	191
tory-----	197	Farmer Cooperative Service participates in	
Durley, Chester, helped Sunset Community--	12	RC&D project activities-----	127
DYER, E. B.: Tennessee Community School		Farmers Home Administration—	
Provides a Study in Conservation at Work	283-284	Lake-Locust Island Project (N.J.)-----	179
DYKES, J. C.: The Unfinished Job-----	243-245	loan to fruit growers association (N. Mex.)--	132
		made available emergency loans (Alaska)--	31
EAGLES, L. D.: Roadside Beauty and Safety.		participates in RC&D project activities-----	127
With O. S. Kirpatrick-----	111-112	provided special help for farmers, Clark	
EARLE, J. B.: Police Juries Boost Small Wa-		Fork (Mont.)-----	59
tershed Activity-----	207-208	Farmer's Nature Trail. Frank Leavitt-----	177
Earthmoving—		Farmers Plant Trees to Beautify New Inter-	
for leveling fields (Colo.)-----	96	state Highway Route. Elmer L. Worthing-	
present unique problems, Chippewa River		ton-----	225-226
Tributaries and Hawk Creek watershed		Farmland To Recreation and Homes. Harold	
(Minn.)-----	15	B. Porter-----	212
earthquake damage to agriculture (Alaska)--	30-31	FARNES, P. E.: SCS Helps Repair Land Dam-	
Economic(s)—		aged by Montana Flood-----	41
grazing and recreation on ranch profitable.	240	Federal Extension Service participates in	
income from herd to offset cropland reduc-		RC&D project activities-----	127
tion (N. Dak.)-----	236	Ferrier, Frank, sinkhole pond (Va.)-----	115
recreation combined with grassland farming		fire protection from farm pond (Wash.)-----	19
to bolster farm profits-----	276	fish migratory habitat requirements in water-	
restored farm incomes and profitable musk-		shed plans, Skipanon River (Oreg.)-----	172
rat trapping, Hancock Bridge (N.J.)-----	180	FISHER, JAMES R.: Large Floodways Present	
returns from Christmas trees profitable---	117	Problems in Construction-----	15-16
Economic Research Service—		Fletcher, John and Stan, developed soil con-	
analysis shows Arkansas cropland reduced--	196	servation plan-----	42
helps conduct river basin surveys-----	136	Flood(s)—	
participates in RC&D project activities---	127	historical data used for highways (Mo.)---	43
Ecotypes, the Search for. M. D. Atkins-----	58	in Montana makes urgent needed land use	
EDMINSTER, FRANK C.: Quality in Outdoor		changes and complete watershed treat-	
Recreation-----	87	ment-----	41
Education—		prevented by Roanoke Creek watershed	
Annual Youth Conservation Camp (Ariz.)--	175-176	(Miss.)-----	199-201
Camp Salem for Boy Scouts (La.)-----	189	Floodways, Large, Present Problems in Con-	
Grange Conservation Tour for 8th grade		struction. James R. Fisher-----	15-16
groups--(Mont.)-----	186	Florida—	
outdoor laboratory at Moravia Central		creeping bluestem, Arcadia Plant Materials	
(N.Y.)-----	185	Center-----	106
outdoor laboratory, Unaka school (Tenn.)--	283-284	Taming Wild Wells in. Donald E. Vander-	
outdoor schoolroom (N. H.)-----	184	grift-----	257-258

	Page		Page
FOGLE, PEARL L.: Conservation Work Wins FFA Award.....	141	Grass(es)—Continued	
FORTE, CARL S.: More and Better Grass Pays in Great Plains. With George E. Bailey---	168	Lehmann, lovegrass, tall fescue, Los Banos trefoil, Siberian wheatgrass, etc.....	6
Forest Service—		More and Better, Pays in Great Plains. George E. Bailey and Carl S. Fonte.....	168
assisted with planting of trees (Ark.)-----	10	New, for the Southeast. W. C. Young and H. L. Leithead.....	106-107
combined with others on Boy Scout Jam-boree .....	84	of importance in the Plains.....	58
dedicated tract to recreation, Holly Springs (Miss.) .....	198	on uplands on SCS retiree farm (Tenn.)---	285
helps conduct river basin surveys.....	136	paille fine for marshlands (La.)-----	279
manager of National Forests.....	71	Pensacola bahiagrass for highways.....	111
participates in RC&D project activities.....	127	Seeding Pays off on Kansas Estate. Arthur W. Pope.....	284-285
provided instructors for Grange Conservation Tour (Mont.)-----	186	Used in Cropland Shifts. Maurice E. Ahern .....	235
provided special help for farmers, Clark Fork (Mont.)-----	59	Gravity Flow Sprinkler System for Foothill Irrigation .....	90-91
4-H Club conservation project.....	81	Grazing Native Grass Proves Conservation Use of Fresh Marsh. Thomas N. Shiftlet---	279
FREEMAN, DANNY: Youth Conservation Camp. 175-176		Great Plains—	
FREEMAN, ORVILLE L.: Natural Beauty and Conservation. From address to Minnesota Conservation Federation.....	212-214	Conservation Meets a Regional Problem. Norman A. Berg.....	248-250
Fry, James E., leveled his fields.....	96	short grass country, a trouble spot.....	244
FULLER, LEWIS: Grange Tour Shows Conservation .....	186	Snowscape .....	188
funds from admission and user fees, taxes, net proceeds from sales.....	161	States 1963-64 wind erosion statistics.....	46
Future Farmers of America given space at the outdoor laboratory (N.Y.)-----	185	wind erosion curves.....	108
Georgia—		Great Plains Conservation Program—	
Appalachia .....	221	a pilot program given authorization of millions of dollars.....	250
Appalachian Regional Development Act....	270-271	cost-shares Kent Creek watershed (Tex.)-	118
Gwinnet County RC&D, undergoing rapid change from agriculture to urban.....	129	first cooperator in Adams Co. (Colo.)----	96
J. Irwin Davis. District Profile.....	260-261	floodwater spreading systems (Mont.)-----	261
stabilizing backslopes on roadbanks.....	163	gains in fiscal year 1964.....	109
switchgrasses at Americus Plant Materials Center .....	106	half of land in drainage above floodwater-retarding structures (Nebr.)-----	68
Ghost Ranch Museum.....	78-81	increased cost-share rate for adapted varieties of grass.....	58
Goddard, R. Guy, appreciates outdoors (S. Dak.) .....	255	planted sorghum and left stubble (Colo.)---	168
Golf Balls and Barbecue Replace Apricots. Robert F. Tegner.....	32	progress for 1964.....	136-137
GOWDER, LUTHER E.: Soil Display Boards Aid "Know Your Soil" Campaign. With James A. Cotton.....	256	scheduled grass seeding, Graham County (Kans.) .....	284
GRAHAM, EDWARD H.: SCS Goes Abroad.....	3-5, 20	Great Society, Technical Guides, Keeping Up. D. A. Williams.....	119
Graham, Jewell, Mud River Conservancy District (Ky.)-----	9	GRIZZELL, ROY A.: Attract Birds and Other Wildlife to Rural Areas. With Verne E. Davison .....	88-89
Grange Tour Shows Conservation. Lewis Fuller .....	186	Grundy Experimental Farm (Iowa). Cover picture .....	[99]
Grass(es)—		GUERNSEY, WALTER J.: Narrow Strips, Grass Cover Wins Favor With Farmers.....	160-161
and sericea lespedeza on roadbanks (Ga.)--	163	Gully(ies)—	
Bluestem in a Black Wrapper. Sy Ekart and Leo Brown.....	186	in Cedar Draw, Cataract Ditch (Colo.)----	281
cover adopted by tobacco farmers (Ky.)---	236	plugged by Christmas trees (Mont.)-----	154
cropland converted to (N. Dak.)-----	236	GUTHRIE, HELEN, MRS.: Litterbugging.....	188
floodwater-spreading system dikes seeded to western wheatgrass (Mont.)-----	261		
Improves Highway Scenes (S.C.)-----	120	HAFENRICHTER, A. L.: New Conservation Plants in the West.....	6-8
land infested by brush (Tex.)-----	150	HAMMOND, WILLIS: Pleasure and Profit From Ranch Resources. With Richard Porter and R. D. Anderson.....	240
		HANCHETT, EUGENE C.: Life for White River Area .....	126



Harms, Jeff, receives Hornaday Award (S. Dak.) .....	Page 19	Iowa—	Page
HARPER, CHARLES N.: Clubs and Schools Join Churches in Soil Stewardship.....	226	county soil surveys aid assessors in valuing agricultural land for tax purposes.....	109
harvest time. Cover picture. (Wash.).....	[1]	Farmers Find Self Help Pays Off. Jim Mander .....	141
HAYES, WILLIAM A.: Minimum Tillage for Potatoes. With Clifford Roy.....	103-104	Grundy Experimental Farm. Cover picture .....	[99]
Health, Education, and Welfare, Department of—co-partner in river basin planning.....	136	reduced tillage, chisel plow.....	105
HEARD, W. L.: Teamwork at Holly Springs....	198-199	Starmont High School, 80 acres includes outdoor education.....	187
Hendershot, Robert E., FFA award (Ohio)....	141	Irrigation—	
HENNINGER, C. M.: Lumber Is Our Crop.....	53-55	farm bought and restored by Scotts Bluff District (Nebr.).....	234-235
Heritage for Our Descendants—a Conservation Challenge From the White House Message on Natural Beauty.....	227-230	gravity-flow sprinkler system.....	90
Highway(s)—		siphon for water for State reformatory.....	188
Appalachian development highway system....	222	systems rebuilt increases dairy output.....	285
Appalachian System (Ga.).....	271	water management after leveling.....	42
construction exposed large areas to mercy of rain and wind.....	287	ISGUR, BENJAMIN: Unified Conservation Planning .....	27-29, 45
field windbreaks and wildlife plantings along interstate (N. Dak.).....	225	JACKSON, DELBERT E.: Lazy 6 Lakes Fishing Area Brings Cash, Fun for Owner.....	16
grass for scenic beauty.....	111	Jewish farmers all over world pioneered in techniques of soil conservation.....	220
State. Construction and Soil and Water Conservation. M. J. Snider.....	43-44	JISKRA, RICHARD D.: Sediment Threat Stirs Landowners. With Harry W. Bell.....	68
HILL, MICHAEL D. Soil Conservation in Alaska .....	33-35	JOHNSON, LYNDON B.: Natural Beauty and Conservation. From White House Message to Congress on Natural Beauty.....	213
Hillewaert, John, Frank, and Alphonso, use gradient ditches (Colo.).....	281	JONES, T. F.: What Do Retired Conservationists Do?.....	285
Holly Springs, Teamwork at. W. L. Heard....	198-199	Julien, Leonard and Harold, invented a mechanical sugarcane planter (La.).....	233
Holzwarth, John and Mrs., operate Never Summer Ranch (Colo.).....	202	Julley, William, followed through on fire protection .....	19
HORTIN, JOHN K.: Sagebrush Gives Way to Tall Grass.....	144	Kansas—	
Houck, Roy, cattle drive (S. Dak.).....	155	bluestem grass.....	186
Howard, Mrs. William B., combines outdoor recreation with grassland farming (Md.)....	276	SCS specialist, Orleansville, Algeria.....	5
Huff, S. B., planted loblolly seedlings (S.C.)..	201	seeding native grasses on eroded cropland, Rice Estate.....	284
Icelandic State Park Makes Good Use of Watershed Lake. Arthur H. Cratty.....	259	Kentucky—	
Idaho—		Appalachia .....	221
cows score from sound pasture management and irrigation systems.....	285	counties included in Appalachian Region....	268
gravity-flow sprinkler system.....	90	Mud River Watershed Project.....	9
Northern panhandle RC&D unique features .....	130	narrow stripcropping and grass cover.....	160
stripcropping .....	105	Key Goals for Conservation. T. B. Clair.....	51, 52, 68
Twin Falls SCD, seed production industry....	6	KEYES, WILLIAM J.: Minimum Tillage for Corn and Soybeans.....	103-104
Illinois—		Kimsey, Floyd, Oren, and Deyo, sell lumber not standing timber (Tenn.).....	53
Lazy 6 Lakes fishing.....	16	KINDER, GEORGE: A Pond Is a Place of Many Delights .....	197
minimum tillage for corn and soybeans....	103	KIRKPATRICK, O. S.: Roadside Beauty and Safety. With L. D. Eagles.....	111-112
pond an outdoor laboratory as well as source for livestock.....	197	KLINE, DONALD D.: Conservation Therapy....	223-224
shaft-mining, Madison Coal Co.....	154	KOERNER, ROBERT O.: Sportsman Makes Wildlife Haven of His South Dakota Farm.....	255-256
Indiana—		Korea, water leveling.....	67
Lincoln Hills RC&D, unique features.....	129	Lana: A Vetch for the West. H. W. Miller....	152-154
Information, Office of, participates in RC&D project activities.....	127	Land—	
Interior, Department of, co-partner in river basin planning.....	136	and Water Conservation Fund Can Aid Local Recreation Plans. Henry F. Nichol....	161-162
International Voluntary Service provides assistance to SCS, Algeria.....	5		

Land—Continued	Page	Manning, Joe, converted valley land to golf course (N. Dak.)	Page
clearing widest applied practice in Alaska	35	maps, range	288
converted to grass (N. Dak.)	236	MARCUM, ROBERT H.: A Look at Appalachia—Its Problems	149
Damaged by Wind Erosion in Great Plains—Leveling Is Investment for Ranchers.	46	MARRIAGE, L. DEAN: Hope for Salmon and Steelhead	268–269, 282–283
Bruce A. Lindahl	42	marshland, grazing on paille fine (La.)	171–173
owners and Farmers Plan Shrubs for Wildlife, Many New. David N. Allan	183–184	Maryland—	279
owners make an impressive contribution of their own resources	250	Appalachia	221
resource sections in whole State represented in outdoor laboratory (N.J.)	82	Loch Raven Reservoir survey showed land treatment program reduced sediment	196
shift from cropland to grass	167	National Cartographic Laboratory	23
shift from crops to trees (Tenn.)	53	Urban Farm Thrives on Double Duty Land Use	276–278
Treatment Gets Emphasis. Joe B. Norris	118	watershed under complete conservation treatment. Cover picture	[218]
Treatment—What Districts Do. D. A. Williams	215	Massachusetts conservation commissions for urban programs	27
use adjustment for economic improvement in Appalachia	222	MCCANNA, DR. HENRY A.: The Church in Resource Conservation and Development	219–220
use conversions and treatment measures essential on watershed lands	196	McCrane, Mrs. Emma, follows a conservation plan (Colo.)	240
Land Management, Bureau of, assists landowner make an inventory of his range resources	159	McKINSTRY, NEAL P.: Conservation Design Tames the Old Cataract Ditch	281–282
LARSON, E. JOSEPH: New Soil Classification	99–102	McRaney, Rev. J. A., builds farm and church	232
Lazy 6 Lakes Fishing Area Brings Cash, Fun for Owner. Delbert E. Jackson	16	MELLINGER, ROSS: A Look at Appalachia in Perspective. With Glendon P. Burton	271–273
LEAVITT, FRANK: A Farmer's Nature Trail	177	Michigan—	
Legume(s)—		Central Montcalm School under a conservation plan	192
Lana vetch	152	Charles Howell Scout Reservation	17
Lana vetch for rangeland	7	first-offense young men work at conservation projects	223
LEITHEAD, H. L.: New Grasses for the Southeast. With W. C. Young	106–107	Gwinn Public Schools, conservation plan includes woodland for a day camp	187
LEMMON, PAUL E.: Soils Information for Woodland Planning	63–64	pastor stimulated concern for hungry people of the world	219–220
LEMMONS, BUD: Animal-Unit Leases Help Balance Grazing on Pilot Rock Range. With Edgar Baumann	209–210	ski area, Brady's Hill	55
LINDAHL, BRUCE A.: Land Leveling Is Investment for Ranchers	42	MILLER, H. W.: Lana: A Vetch for the West	152–154
LIPMAN, RABBI EUGENE J.: Through the Centuries	220	Minimum Tillage—For Corn and Soybeans. William J. Keyes. For Potatoes. William A. Hayes and Clifford Roy	103–104
Litterbugging. Mrs. Helen Guthrie	188	Minister Builds Farm and Church. W. C. Nelms	232
LONG, LARRY H.: Mechanical Sodding Method Solves Waterway Problem	113–114	Minnesota—	
Louisiana—		Chippewa River Tributaries and Hawk Creek watershed floodway improvement	15
Camp Salemen for Boy Scouts	189	Crow Wing Canoe Trail, RC&D project	123
native grass on marshland	279	West Central RC&D unique features	129
Negroes invented a mechanical sugarcane planter	233	Mississippi—	
parish police juries authority to contract for, etc., watershed projects	207	Chewalla Lake first reservoir in Southeast developed for multipurposes on national forest land	198
recreation on Rocky Ford Branch	254	creeping bluestem, Coffeetown Plant Materials Center	106
ricelands wildlife paradise	173	Delta Ministry enlisting programs to obtain equal economic opportunity	220
Lumber Is Our Crop. C. M. Henninger	53–55	minister converts rundown land into garden spot	232
Maine—			
landscaper used to sod waterways	113		
minimum tillage for potatoes	103		
Management, Good. D. A. Williams	143		
MANDER, JIM: Iowa Farmers Find Self Help Pays Off	141		
Manderfield, Hubert, strip crops (Idaho)	105		



	Page		Page
Missouri—		New Mexico—Continued	
nursery fields not covered with trees seeded		Northern Rio Grande RC&D unique fea-	
to grass and legumes for cattle.....	116	tures .....	129-130
State Highway Department realizes erosion		northern, a trouble spot.....	244
and drainage control good investments..	43	Newnham, Lyn, receives Wildlife Conserva-	
Montana—		tion Award (Ohio).....	185
Clark Fork, small timber.....	59	New York—	
Grange Conservation Tour.....	186	Appalachia Act extended to.....	221
gullies plugged by Christmas trees.....	154	conservation plan for school playground....	39
1964 flood from mountainous region.....	41	Ischua Creek watershed, recreation and	
Plant Materials Center concentrating on		wildlife opportunities.....	75-76
ecotypes .....	58	nature trail on Belknap farm.....	177
rancher developing floodwater—spreading		outdoor laboratory.....	185
systems .....	261	Senior High School, 130 acres includes out-	
MOORE, CLARK L.: Monterey Pines Make Good		door education.....	187
Christmas Trees.....	117	three-man team represented SCS in Boy	
MOORE, HOMER C.: Pasture-Hay Program		Scouts .....	86
Makes Dairy Farm Pay.....	285	New Zealand soil and water problems.....	167
Moravia Students Learn Conservation on		NICHOL, HENRY F.: Land and Water Con-	
School Farm.....	185-186	servation Fund Can Aid Local Recreation	
Mouton, Raymond, grazes on marshland		Plans .....	161-162
(La.) .....	279	NORRIS, JOE B.: Land Treatment Gets Em-	
Multipurpose Reservoir and Land Treat-		phasis .....	118
ment .....	216	North Carolina—	
MYERS, ROBERT E.: Watershed Wildlife. With		Appalachia .....	221
Homer E. Stennett.....	75-76	Biltmore became site of first forestry school	
Narrow Strips, Grass Cover Win Favor With		in America.....	47
Farmers. Walter J. Guernsey.....	160-161	Nursery Alternates Trees and Cattle in Same	
National Audubon Society.....	92	Fields. William H. Billings and B. H.	
Natural History Societies—John Vosburgh		Rountree .....	116
and Shirley A. Briggs.....	92-93	NYLANDER, PAUL E.: Behind the Scenes on a	
Nebraska—		Watershed Construction Job.....	202-206
Bowman-Spring Branch, scene of reducing		OERTEL, ROBERT W.: A Look at Appalachia—	
silt threat.....	68	The Program.....	270-271
Custer County, leading church layman focal		OGLE, CLAYTON: Water Spreading Gives	
point for resource development.....	219	Rancher Use of Rainfall.....	261
Lincoln, Regional Technical Center.....	23	O'HAYRE, JOHN: Rancher Makes Showplace	
Scotts Bluff District developed a conserva-		on Private, Public Land. With Edwin P.	
tion irrigation farm.....	234	Engle .....	159
Negroes—		Ohio—	
Anna Strong and Carthelia Jordan receive		Agency Gives Wildlife Award. Adrian	
awards from essay contests (Ark.).....	42	Achtermann .....	185
given assistance, Sunset Community (Ark.)		Air Polution Department estimated tons of	
invented a mechanical sugarcane planter		red dust settled on Cincinnati.....	248
(La.) .....	233	Appalachia .....	221
operate farms in part of Johnson Creek		Colerain Senior High School, 58 acres in-	
watershed (Tenn.).....	251	cludes outdoor education.....	187
NELMS, W. C.: Minister Builds Farm and		Conservation District Aids Water Develop-	
Church .....	232	ment. Willis J. Ridenour.....	66
NEUBAUER, T. A.: Review of Natural Re-		Holderman ditch problem.....	14
sources for U.S. Growth.....	190	minister spearheaded manpower develop-	
Never Summer Ranch Is Favorite Summering		ment and training.....	220
Spot. Robert W. Woods.....	202	plow-planting .....	105
New Hampshire farmers and new landowners		strip-mining, Avondale area.....	77
spend more time on wildlife preservation..	183	woodland contractor.....	280
New Jersey—		youth wins FFA award.....	141
outdoor laboratory of school.....	82	Oklahoma—	
Silver Lake-Locust Island Project first of		Eldred Sasseen. District Profile.....	237-238
its kind in.....	179	Nolen J. Fuqua. District Profile.....	164-165
New Mexico—		OLIVER, WILLIAM B.: A Shock to Alaska	
Ghost Ranch Museum.....	78-81	Agriculture .....	30-31
Northern Rio Grande RC&D project.....	131		

Oregon—	Page	PLAIR, T. B.—	Page
conservation per-animal leasing for Pilot Rock Division.....	209	Key Goals for Conservation.....	51-52, 68
Plant Center, grass and legume in alternate rows .....	7	Review of "Man and Land in the United States" .....	166
Portland, Regional Technical Center.....	23	Plant(ing, s)—	
Skipanon River watershed tidewater barrier included a barn-door tidegate for fish....	172	conservation, Dulles Airport. Cover picture (Va.) .....	[26]
Upper Willamette RC&D unique features....	130	in West, Russian-Olive Is Prize Landscape. Olan W. Dillon, Jr.....	231-232
OSBORN, BEN O.—		materials progress in 1964.....	139
Review of "Approved Practices in Soil Conservation" .....	69-70	New Conservation, in the West. L. A. Hafenrichter .....	6-8
Review of "Conserving American Resources" .....	46	shrub lespedezas, japonica and bicolor for utility rights-of-way (S.C.).....	11
Review of "Handbook of Applied Hydrology" .....	214	Playground Problems, Solving Part of District Program. George S. Brown.....	39-40
Review of "Land and Water for Recreation" .....	22	Plow(s)—	
Review of "The Economic Demand for Irrigated Acreage".....	286	Chisel, Reduces Erosion. Robert V. Bollman and Ernest E. Behn.....	105
Outdoor(s)—		Planting for Fewest Trips. John Battles..	105
Laboratories, Larger School Properties Provide for.....	187	Police Juries Boost Small Watershed Activity. J. B. Earle.....	207-208
Laboratory Builds Interest in All Studies. Erling W. Clausen.....	82-83	POMEROY, KENNETH B.: American Forestry Association Sponsors Multiple Use, Conservation .....	67
Learning, Room for.....	192	Pond(s)—	
Outdoor Recreation, Bureau of, administers the Land and Water Conservation Fund Act .....	161	Farm, Serves Fire Protection and Recreation. Lenn Dompier.....	19
Ozarks, a trouble spot.....	244	Fish in Puerto Rico.....	57
Pampered Stream Responds With Beauty and Utility. John Cross and Jimmie Wyche .....	254	Is a Place of Many Delights. George Kinder .....	197
PARTAIN, LLOYD E.: Review of "Waterfowl Tomorrow" .....	142	Sinkhole, Provide Water in Limestone Area .....	115
Pasture-Hay Program Makes Dairy Farm Pay. Homer C. Moore.....	285	POPE, ARTHUR W.: Grass Seeding Pays Off on Kansas Estate.....	284-285
Paulson, Arthur, cleared first ski runs.....	55	Population—	
PEEPLS, GEORGE R.: A Conservation Plan for County Roadsides.....	163	exodus from Appalachia after World War II (W. Va.).....	272
Pelley, Donald, Estel, and Jim use gradient ditches (Colo.).....	281	exodus in Appalachia rapid since World War II (Ky.).....	282
Pennsylvania—		PORTER, HAROLD B.: Farmland to Recreation and Homes.....	212
Appalachia .....	221	PORTER, RICHARD: Pleasure and Profit From Ranch Resources. With Willis Hammond and R. D. Anderson.....	240
Boy Scout Jamboree.....	84	Profile, District—	
conservation photo (Pa.). Cover picture....	[266]	Francis E. Cox of S.C.....	21-22
Muddy Creek. Cover picture.....	[266]	Irwin Davis of Georgia.....	260-261
Penn Soil RC&D unique features.....	130	Nolen J. Fuqua of Oklahoma.....	164-165
Two-man teams represented SCS in Boy Scouts Jamboree.....	86	Monroe Samuel of Arkansas. Lawrence W. Compton .....	69
Upper Darby, Regional Technical Center..	23	Eldred Sasseen of Oklahoma.....	237-238
personnel progress, 1964.....	140	Puerto Rico fish pond.....	57
pesticides menace from duststorms.....	249	Ranch Resources, Pleasure and Profit. Willis Hammond, Richard Porter, and R. D. Anderson .....	240
Pheasant Hospitality Association Welcomes Hunters to Plains. Thomas J. Skillman....	178	Rancher Makes Showplace on Private, Public Land. Edwin P. Engle and John O'Hayre..	159
Pigorsh, Sheriff Arnold, originator of minimum security project (Mich.).....	223	Range—	
Pines Like Money in Bank for Banker-Farmer .....	201-202	Conservation, New Zealand Lessons. D. A. Williams .....	167
Pines, Planted Are Major Crop on Plantation .....	72	conservation progress in 1964.....	139



Range—Continued	Page	Recreation—Continued	Page
forage, Lana vetch-----	152	Yuma Pheasant Hospitality Association	
land revegetated-----	68	(Colo.)-----	178
Pilot Rock, Cunha Tract, land leasing-----	210	Rellers, George, Glenn, and Dale build saw	
rehabilitation on private and public land		mill (Mont.)-----	59
(Colo.)-----	159	Resource Conservation and Development—	
surveys, new system-----	147	helped by churches-----	219-220
Rate of Practice Application Gains in Great		project(s)—	
Plains-----	109	Awakens Area, Northern Rio Grande.	
RAY, MERRILL D.: Brady's Hills Ski Area.		Richard B. Bowen-----	131-132
With James M. Cooper-----	55-57	Crow Wing Canoe Trail (Minn.)-----	123
RECHENTHIN, C. A.: The Texas Brush Prob-		designated-----	133
lem. With H. N. Smith-----	150-152	First 10, Show Scope of Activities-----	129-130
Reclamation, Bureau of, San Juan-Chama		White River (Vt.)-----	126
Project-----	132	White River (Vt.). Cover picture-----	[122]
Recreation—		Resource Development, Opportunities in.	
and—		John W. Barnard-----	127-128
grazing profitable on ranch (Colo.)-----	240	resource team approach (Mass.)-----	29
hunting area bought by Negro business-		Reviews—	
men and farmers, Johnson Creek		Approved Practices in Soil Conservation.	
(Tenn.)-----	252	By Albert B. Foster-----	69-70
Livestock Make Happy Combination.		Conservation in People's Hands. By AASA	
Gilbert F. Schwandt-----	288	Commission on Conservation-----	22
wildlife, Ischua Creek Watershed (N.Y.)-		Conserving American Resources. By Ruben	
Annual Youth Camp to study natural re-		L. Parson-----	46
sources (Ariz.)-----	175	The Economic Demand for Irrigated Acre-	
areas, Northern Rio Grande RC&D Project		age. By Vernon W. Ruttan-----	286
(N. Mex.)-----	132	Farmer's World. The Yearbook of Agri-	
bonus on Bayou Rapides and Bayou Boeuf		culture-----	118
watersheds (La.)-----	207	Forage Plant Physiology and Soil-Range	
Crow Wing Canoe Trail, RC&D project		Relationships. R. E. Williams-----	262
(Minn.)-----	123	Handbook of Applied Hydrology. Edited by	
from Horse Pen Run's single flood-retarding		Ven Le Chow-----	214
structure, Dulles (Va.)-----	38	Land and Water for Recreation. By Marion	
homes, lake, and golf course constructed		Clawson-----	22
on farmland (Wis.)-----	212	Man and Land in the United States. By	
hunters paid to use Lana vetch field-----	153	Marion Clawson-----	166
in Appalachia (W. Va.)-----	272	Natural Resources for U.S. Growth. By	
income-producing enterprises progress,		Hans H. Landsberg-----	190
1964-----	134	Planning Our Town. By Martha E. Man-	
Mud River watershed (Ky.)-----	9	zer-----	214
nature trail joint farm effort of Belknap		Tomorrow's Wilderness. Edited by Fran-	
and gun club (N.Y.)-----	177	cois Leydet-----	69
Never Summer Ranch, horseback riding,		Waterfowl Tomorrow. Edited by Joseph	
hiking, fishing (Colo.)-----	202	Linduska-----	142
on private land provided by Land and		Wildlife Management and Conservation.	
Water Conservation Act-----	162	By James B. Trefethen-----	190
on Rocky Fork Branch (La.)-----	254	World Prospect for Natural Resources.	
opportunities improved by tree planting---	52	By Joseph L. Fisher-----	238
pond stocked with fish-----	19	Riceland Wildlife Habitat. Carl H. Thomas--	173-174
ponds, Lazy 6 Lakes (Ill.)-----	16	RIDENOUR, WILLIS J.: Conservation District	
Quality in Outdoor. Frank C. Edminister--		Aids Water Development-----	66
sites preserved by private enterprise		RIECKEN, F. F.: Soil Survey Use in Iowa.	
(Calif.)-----	32	With W. D. Shrader-----	109-110
ski runs supplement farm income (Mich.)--	55	Riser, Louis, Jr., plow planting (Ohio)-----	105
South River subwatershed of Potomac.		river basin surveys, progress in 1964-----	135-136
Cover picture-----	[194]	ROSS, ROBERT L.: Christmas Trees Make	
summer-day camp and horseback riding on		Gully Plugs-----	154
grassland farm (Md.)-----	276	ROTH, BERNHARD A.: Airport Conservation	
Sunset Community Rural Areas Develop-		Makes Good Neighbor-----	36-39
ment (Ark.)-----	13	ROUNTREE, B. H.: Nursery Alternates Trees	
swimming area on Lime Lake (Mich.)----	18	and Cattle in Same Fields. With William	
		H. Billings-----	116

	Page
ROY, CLIFFORD: Minimum Tillage for Potatoes. With William A. Hayes-----	103-104
runoff rate reduced by land use practices----	196
Rural—	
and urban working together (Mass.)-----	45
community revives its economy (Tenn.)--	251-253
poverty alleviated by use of soil and water resources -----	119
Rural Areas—	
Attract Birds and Other Wildlife to. Roy A. Grizzell and Verne E. Davison-----	88-89
Crow Wing Canoe Trail, RC&D project (Minn.) -----	123
Development—	
associations sponsor RC&D project (N. Mex.)-----	130
associations sponsored RC&D project (N. Mex.) -----	131
by police juries for Bayou Rapides and Boeuf watersheds (La.)-----	207-208
by Roanoke Creek watershed (Miss.)----	199
Committees important in stimulating RC&D projects-----	128
in Sunset Community (Ark.)-----	12-13
movement contributed to by churches----	219
Mud River watershed (Ark.)-----	9-11
watershed project for recreation, Holly Springs (Miss.)-----	198
economy built up by woodlands, Clark Fork (Mont.) -----	59-62
White River Resource Conservation and Development Project (Vt.)-----	126
Rural Areas Development, Office of, participates in RC&D activities-----	127
Rural Electrification Administration, loan for sawmill (Mont.)-----	59
participates in RC&D activities-----	127
RUSH, RICHARD W.: Agencies, Landowners Join Efforts to Improve Ditch. With William F. Brown-----	14
Sagebrush Gives Way to Tall Grass. John K. Hortin-----	144
Salmon and Steelhead, Hope for. L. Dean Marriage -----	171-173
SCHWANDT, GILBERT F.: Recreation and Livestock Make Happy Combination-----	288
Security of Johnson Creek-----	251-253
Sediment—	
The Cost of. D. A. Williams-----	287
deposition reduced by land treatment measures -----	196
discharge in Potomac River Basin-----	274-275
Threat Stirs Landowners. Richard D. Jiskra and Harry W. Bell-----	68
seed patch program to raise Negro living standards (Tenn.)-----	251
shaft-mining (Ill.)-----	154
SHIFLET, THOMAS N.: Grazing Native Grass Proves Conservation Use of Fresh Marsh--	279
SHRADER, W. D.: Soil Survey Use in Iowa. With F. F. Riecken-----	109-110

	Page
SKILLMAN, THOMAS J.: Pheasant Hospitality Association Welcomes Hunters to Plains---	178
Sloss, James P., range rehabilitation on private and public land (Colo.)-----	159
Small Business Administration loan for sawmill (Mont.)-----	59
SMITH, DWAYNE C.: A Modern Cattle Drive. With Herbert R. Davis-----	155-158
SMITH, H. GRANVILLE. Spoilbanks and Bird-life -----	77
SMITH, H. N.: The Texas Brush Problem. With C. A. Rechenthin-----	150-152
SNIDE, M. J.: State Highway Construction and Soil and Water Conservation-----	43-44
sodding waterway mechanically-----	113-114
Soil(s)—	
and water conservation plan accepted by Dulles' builders (Va.)-----	38
and Water Conservation and Resource Development -----	133-140
Conservation in Alaska. Michael D. Hill--	33-35
Display Boards Aid "Know Your Soil" Campaign. Luther E. Gowder and James A. Cotton -----	256
Erosion in Urban Areas. Verne M. Bathurst -----	274-275
Information for Woodland Planning. Paul E. Lemmon-----	63-64
New Classification. E. Joseph Larson-----	99-102
Soil Conservation District(s)—	
almost all of Negro farms were cooperating with (Tenn.)-----	251
broadened to conservation (Mass.)-----	27
Builds Woodland Economy-----	59-62
Buys and Restores Farm to Demonstrate Good Practices. R. H. Boecking-----	234-235
completion of subdistrict spurred by earthquake (Alaska)-----	30
create new wealth in rural and urban America -----	215
Flathead, furnished instructors for Grange Conservation Tour (Mont.)-----	186
Greene County conducts "Know Your Soil" campaign (Ala.)-----	256
have taken the lead at local level in developing leadership in RC&D projects----	127
helped in water velocity problem (Mo.)----	44
helps double water development projects (Ohio) -----	66
Lee County, controls artesian wells (Fla.)--	257-258
made strides in woodland conservation-----	71
may qualify for grants-in-aid from land and water conservation fund-----	161
one organized in Alaska-----	33
program for assistance of all landowners, not farmers alone-----	39
progress for 1964-----	134
provided technical guidance by SCS on practices that improve wildlife habitats -----	191



Soil Conservation District (s)—Continued	Page	Soil Survey (s)—Continued	Page
sought evaluation of Dulles' impact on scientific land use planning (Va.)-----	37	used in home, lake, and golf course construction (Wis.)-----	212
State in lead to modernize its districts' functions (Ark.)-----	258	Use in Iowa. W. D. Shrader and F. F. Riecken -----	109-110
supervisors expect Appalachian Regional Development Act to speed up program (Ga.) -----	270	will start using new soil classification-----	99
will join others in making plans to use provisions of Appalachian Act-----	267	SORENSEN, LAWRENCE W.: A Half Century of Stripcropping -----	105
Soil Conservation Magazine marks 30th anniversary -----	212	South Carolina—	
Soil Conservation Service—		Appalachia -----	221
and Magazine Mark 30th Anniversary-----	212	banker-farmer gets cash income from crop of trees-----	201
assists landowner make inventory of his range resources (Colo.)-----	159	Francis E. Coxe, District Profile-----	21-22
charged with guiding recreation development on private land-----	87	Grass important part in highway construction -----	111
combined with others on Boy Scout Jamboree -----	84	Sunnyhill Plantation, 10,000 acres of pines--	72
designated to administer RC&D project activities -----	127	South Dakota—	
developed a new type of technician—the soil conservationist-----	244	cattle drive by Roy Houck-----	155
furnished technical assistant to Sunset Community (Ark.)-----	13	Eagle Scout receives Hornaday Award-----	19
Goes Abroad. Edward H. Graham-----	3-5, 20	experimental plot of 30 grass varieties-----	235
gains in management value-----	143	Ray Houck trail drive. Cover picture-----	[146]
had a hand in Lana's development-----	152	RC&D unique features-----	130
Has Unofficial Role Under Economic Opportunity Act-----	189	sportsman has ducks and geese year-round--	255-256
helped in water velocity problem (Mo.)-----	44	Spitzer, Alvin, completed all steps of conservation plan (N. Dak.)-----	236
Helps Repair Land Damaged by Montana Flood. P. E. Farnes-----	41	Spoilbanks and Birdlife. H. Granville Smith--	77
made and interpreted soil surveys Clark Fork (Mont.)-----	59	Sportsman Makes Wildlife Haven of His South Dakota Farm. Robert O. Koerner--	255-256
prepared plans based on soil survey for many school sites (Mich.)-----	187	Springs Solve Water Problem-----	96
progress for fiscal 1964-----	137-139	State Reformatory Is Site of Unique Pipeline. A. G. Crook-----	188
provides assistance on woodland aspects of conservation farm plan-----	71	STENNETT, HOMER E.: Watershed Wildlife. With Robert E. Myers-----	75-76
Range Surveys-----	147-149, 162	Stephens, Sidney O., domain conservation showplace (Mich.)-----	17
Rate of Progress in Programs Shows Increase in Fiscal 1964-----	93	Stripcropping—	
responsibility to landowners never ends-----	68	A Half Century. Lawrence W. Sorensen--	105
Services To Urban Areas. D. A. Williams--	47	narrow tobacco strips in fields (Ky.)-----	160
Soil Stewardship—		strip-mining, Ohio Power Co-----	77
and Growth. D. A. Williams-----	239	Sunset Community, New Hope for. Otis Thompson -----	12-13
churches help Resource Conservation and Development -----	219-220	technical guides-----	119
Clubs and Schools Join Churches in. Charles H. Harper-----	226	Technical Service Centers. D. A. Williams--	23
Jewish farmers instituted the Seventh Year -----	220	TEGNER, ROBERT F.: Golf Balls and Barbecue Replace Apricots-----	32
minister builds farm and church (Miss.)--	232	Tennessee—	
Soil Survey (s)—		Appalachia -----	221
an SCS program containing nonagricultural benefits -----	47	Community School Provides a Study in Conservation at Work. E. B. Dyer-----	283-284
detailed maps greatest demand (Alaska)--	34	cropland reduced by PL-566 projects-----	196
information for many school sites (Mich.)--	187	Johnson Creek, rural community pulling itself out of category of depressed area-----	251
map showed 11 farmers would benefit from drainage (Ohio)-----	14	pine and hardwood trees-----	53
shaft-mining land (Ill.)-----	154	SCS retiree becomes full-time conservation farmer -----	285
		Texas—	
		Brush Problem. H. N. Smith and C. A. Rechensthein -----	150-152
		fawn. Cover picture-----	[170]
		Ft. Worth Examining Board-----	140
		Ft. Worth Regional Technical Center-----	23
		grasslands a trouble spot-----	244

Texas—Continued	Page	Virginia—Continued	Page
Kent Creek Watershed, land treatment measures .....	118	skilled management of soil and water, Dulles International Airport.....	36
student yearbook.....	173-174	waterproofing pasture sinkholes.....	115
THOMPSON, OTIS: New Hope for Sunset Community .....	12-13	VOSBURGH, JOHN: Natural History Societies. With Shirley A. Briggs.....	92-93
Through the Centuries. Rabbi Eugene J. Lipman .....	220	Wangsgard, Robert, pioneer in control of sagebrush (Utah).....	144
trail drive (S. Dak.). Cover picture.....	[146]	Washington—	
transportation breakdown by earthquake.....	31	fire protection pond.....	19
Tree(s)—		harvest time, Palouse. Cover picture.....	[1]
buffer belt of forest at Dulles (Va.).....	38	Palouse area trouble spot.....	244
Christmas, Make Gully Plugs. Robert L. Ross .....	154	Plant Center spotted Latar orchardgrass....	8
field windbreaks and wildlife plantings along interstate highway (N. Dak.).....	225	Spokane Co., RC&D unique features.....	130
loblolly pines give cash income (S.C.).....	201-202	Water—	
Monterey Pines Make Good Christmas. Clark L. Moore.....	117	development projects given priority by SCD (Ohio) .....	66
on one side of nursery, cattle on other.....	116	Leveling in Korea.....	67
Planted on Shaft Mining Land. Silas W. Brown .....	154	More Business.....	199-201
planting chore Scouts remember (Mich.)....	17	municipal, storage in Appalachia (Ga.).....	270
planting on private land resulted in changes in land use.....	51	Spreading Gives Rancher Use of Rainfall. Clayton Ogle.....	261
planting program to raise Negro living standards (Tenn.).....	251	supplies in Appalachia.....	222
Russian-olive makes a fine shade.....	231	supply forecasting in 1964.....	140
willows, poplars, elms trail plantings.....	65	waste from artesian wells controlled (Fla.) .....	257
Tunisia—		Year, 1964, Varies in West.....	141
operations by SCS, 1964.....	140	Watershed(s)—	
SCS assisting government program.....	3	American Fork-Dry Creek basin seeded by Boy Scouts (Utah).....	211
TURELLE, J. W.: Wind Erosion Control Guides .....	107-109	Big Park overcomes flood and erosion problems (Iowa).....	141
Unfinished Job. J. C. Dykes.....	243-245	Birch Creek, protection plan before flood....	41
Urban(ization)—		Bonds Creek provides protection and recreation (W. Va.).....	273
caused sediment.....	287	Bowman-Spring Branch scene of reducing silt in new floodwater dams (Nebr.).....	68
sedimentation problems.....	275	Chewalla Lake, recreation on national forest land, Holly Springs (Miss.).....	198
sprawl near every great metropolitan center .....	244	Chippewa River tributaries and Hawk Creek floodway (Minn.).....	15
through conservation districts (Mass.).....	27-29, 45	Construction Job, Behind the Scenes. Paul E. Nylander.....	202-206
Utah—		80 approved for Appalachia.....	222
Boy Scouts seeded basin, American Fork-Dry Creek watershed.....	211	Horse Pen Run embraced by Dulles project .....	38
rancher pioneer in control of sagebrush....	144	in Appalachia (Ga.).....	270
VAN BERKOM, LARRY: Conservation Plan Converts Cropland to Grass.....	236	Johnson Creek, program to raise Negro living standards (Tenn.).....	251
VANDERGRIFF, DONALD E.: Taming Wild Wells in Florida.....	257-258	Kent Creek, land treatment measures (Tex.) .....	118
Vermont—		land treatment comes first.....	215
White River RC&D unique features.....	130	Land Treatment. John H. Wetzel.....	195-197
White River RC&D project. Cover picture..	[122]	Little River subwatershed of Coosa River, vegetation on roadbanks (Ga.).....	163
White River Resource Conservation and Development .....	126	Millcreek, diary of the SCS engineer.....	203-206
Virginia—		Mud River.....	9-11
Appalachia .....	221	Muddy Creek, conservation practices (Pa.) Cover picture.....	[266]
Dulles Airport. Cover picture.....	[26]	Oued Marguellig, Tunisia.....	3
Lake Barcroft, urbanization more abrupt..	275	people voted tax to run Bayou Rapides and Bayou Boeuf (La.).....	207
recreation, Brookfield Park. Cover picture..	[75]		
Roanoke Creek watershed, pumps part of municipal water supply system.....	199		



Watershed(s)—Continued		Page	Wildlife—Continued		Page
planning and operations, 1964.....	134-135		Russian-olive attracts birds.....		231
program given new life to towns and cities by curbing floods.....	47		soil interpretation system for wildlife in Northeast applied to Corn Belt and Great Plains .....		139
program sparked interest in conservation...	52		WILLIAMS, D. A.—		
Project Turns the Tide, at Hancock Bridge .....	179-182		The Challenge of Appalachia.....		263
Roanoke Creek will provide additional multiple-use benefits.....	199		Civil Rights Act, Rural Beauty.....		95
Skipanon River tidewater barrier included a barn-door tidegate for fish (Oreg.)....	172		The Cost of Sediment.....		287
Tongue River, Renwick Dam and lake pro- vide recreation, flood protection (N. Dak.) .....	259		Farm Game—Conservation Districts—Wild- life .....		191
Twelve Mile Creek (S.C.).....	11		Good Management.....		143
under complete conservation treatment (Md.). Cover picture.....	[218]		Great Society, Technical Guides, Keeping Up .....		119
Wildlife. Robert E. Myers and Homer E. Stennett .....	75-76		Land Treatment—What Districts Do.....		215
Waterway Problem, Mechanical Sodding Method Solves. Larry H. Long.....	113-114		Range Conservation, New Zealand.....		167
West Virginia—			SCS Services to Urban Areas.....		47
Appalachia .....	221		Stewardship and Growth.....		239
ebb and flow of people and prosperity in Appalachia .....	271-273		Technical Service Centers.....		23
local pastor helped organize Braxton County Development Corporation Committee....	220		Woodlands in the Conservation Program...		71
WETZEL, JOHN H.: Watershed Land Treat- ment .....	195-197		WILLIAMS, R. E.: Review of Forage Plant Physiology and Soil-Range Relationships..		262
What Do Retired Conservationists Do? T. F. Jones .....	285		WILLIAMSON, E. J.: New Award Program Supports 4-H-Club Conservation Project..		81
White River Area, Life for. Eugene C. Hanchett .....	126		Windbreak(s)—		
Wildlife—			along interstate highway (N. Dak.).....		225
and recreation, Ishua Creek watershed (N.Y.) .....	75-76		Field, Patterns Protect Irrigated Sand....		65
areas protected on retiree farm (Tenn.)...	285		widely used practice.....		51
as important as farming business (S. Dak.) .....	255		Wind Erosion—		
bicolor for (S.C.).....	11		Control Guides. J. W. Turelle.....		107-109
Conservation Award given to Lyn Newn- ham .....	185		major problem in Saleha-Big Delta sub- district (Alaska).....		35
fawn (Tex.). Cover picture .....	[170]		showed damage in Texas.....		248
food, cover, and other attractions.....	88-89		Wingfield, George W., pays to reseed sub- marginal cropland to grass (Colo.).....		168
food, Lana vetch.....	152		Wisconsin—		
from reclamation of strip-mining, Avondale area (Ohio).....	77		exact soil profiles.....		86
habitat preservation.....	52		Pri-Ru-Ta RC&D unique features.....		130
has many values for many people.....	191		transformation of farmland to recreation..		212
hunters kept by farmers (Colo.).....	178		water and windbreaks winning combina- tion .....		65
new landowners landscaped home for wild- life preservation (N.H.).....	183		woodlands. Cover picture.....		[51]
plantings along interstate highway (N. Dak.) .....	225		Woodland(s)—		
plantings on nature trail by Turnpike Rod and Gun Club (N.Y.).....	177		as a land use major part in Appalachia (Ky.) .....		282
return of profitable muskrat trappings at Hancock Bridge (N.J.).....	180		built economy, Clark Fork (Mont.).....		59-62
ricelands offer a variety of alternatives for wildlife conservation (La.).....	173		conservation land use. Cover picture (Wis.) .....		[51]
			conservatiton progress in 1964.....		139
			contracting work (Ohio).....		280
			industries developing in Appalachia (W. Va.) .....		273
			in the Conservation Program. D. A. Williams .....		71
			in ski area (Mich.).....		55
			produced profitable lumber (Tenn.).....		53
			suitability of soils determined.....		63
			WOODS, ROBERT W.: Never Summer Ranch Is Favorite Summering Spot.....		202

WORTHINGTON, ELMER L.: Farmers Plant Trees to Beautify New Interstate Highway Route -----	Page 225-226	YOUNG, GLADWIN E.— Preservation of Natural Beauty-----	Page 165
WYCHE, JIMMIE: Pampered Stream Responds With Beauty and Utility. With John M. Cross -----	254	Review of "Conservation—in the People's Hands" -----	22
Wyoming gravity-flow sprinkler system-----	90	Review of "World Prospects for Natural Resources" -----	238
Yearbook Honors Conservationists-----	102	YOUNG, W. C.: New Grasses for the South- east. With H. L. Leithead-----	106-107
		Youth Conservation Camp. Danny Freeman--	175-176



JUL 20 1964

CURRENT SERIAL RECORDS

AUGUST 1964

VOL. XXX NO. 1

# Soil Conservation



## NEW AREAS IN CONSERVATION:

*SCS Goes Abroad*  
Page 3

*Sunset Community  
Moves Ahead*  
Page 12

*Camp Conservation*  
Page 17

Also—  
*New Plants Pay*  
Page 6

SOIL  
CONSERVATION  
SERVICE

U. S. DEPARTMENT  
OF AGRICULTURE



# Soil Conservation

## *Our New Look . . .*

The changed appearance of *Soil Conservation Magazine* with this issue will, we hope, reflect the spirit of change now active in the conservation field.

Administrator Don Williams in the July issue commented that 1964 problems must be met with 1964 methods.

That issue and this tell of new advances in conservation technology and new areas of conservation activity.

For 29 years, *Soil Conservation* has recorded the progress of the soil conservation movement with emphasis on the experiences of farmers and soil conservation districts. We need now to expand our horizons to include nonagricultural landowners, urban and suburban communities, and problems and experiences of the technical people who assist them.

We hope the more modern typography adopted with the first issue of volume 30 will make the magazine more effective in communicating these new developments in conservation.

**Cover picture**—August is harvest time in the rolling Palouse country, as in much of the northern wheat area. Then the conservation farmer reaps the reward of his husbandry—Photo by R. L. Kent, from "America the Beautiful" series.



## CONTENTS

- 3 SCS Goes Abroad**  
New type of contract with AID  
*By Edward H. Graham*
- 6 New Conservation Plants in the West**  
Superior varieties and new methods increase income  
*By A. L. Hafenrichter*
- 9 Mud River Watershed**  
Water supply, recreation, and industry
- 12 New Hope for Sunset Community**  
Rural people, agencies work together
- 14 Agencies, Landowners Join Efforts to Improve Ditch**  
*By Richard W. Bush and William F. Brown*
- 15 Large Floodways Present Problems in Construction**  
*By James R. Fisher*
- 17 Camp Conservation Wins Scout Council Award**
- 21 District Profile**  
Francis E. Coxe, Conservation Man of the Year
- 22 Review**  
Conservation—In the People's Hands; Land and Water for Recreation
- 23 From the Administrator**  
The New Technical Service Centers

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

BEN O. OSBORN  
Editor

GEORGIE A. KELLER  
Editorial Assistant

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Prints of photos can be obtained on request.

**Subscriptions:** Price \$1.50 per year, \$2.25 foreign. Single copy, 15 cents. A discount of 25 percent will be allowed on orders of 100 or more sent to the same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.





Algerian workers forming terraces and waterway near Dupere, Algeria.

# SCS Goes Abroad

## New type of contract with AID sends technicians to foreign lands under SCS supervision

By **Edward H. Graham**  
Assistant to Administrator

**F**OR the first time, the Soil Conservation Service is now operating in foreign lands. In North Africa teams of SCS technicians are assisting the governments of Tunisia and Algeria to plan and apply soil and water conservation programs.

In each country SCS is undertaking the operations under a Participating Agency Service Agreement (PASA) with the Agency for International Development (AID), Department of State, which administers and coordinates assistance programs in less developed countries.

*Dr. Graham is responsible for international programs of the Soil Conservation Service. He spent 4 weeks in March and April reviewing SCS field operations abroad.*

Under the general guidance of AID, SCS assumes operating responsibility for the technical phases of the program.

Soil Conservation Service personnel remain on SCS rolls, report to SCS personnel, and receive their administrative supervision and technical back-stopping from SCS. In short, they function essentially as if they were working for SCS in the United States, with employment rights and opportunities preserved. Overseas they share the challenge and rewards of helping others apply American experience to the solution of new problems in unfamiliar conditions.

In years past a great many SCS people have worked abroad and have contributed to soil and water conservation in countries throughout the world. They usually trans-

ferred to another agency or organization, such as a foundation, FAO, or AID, although they retained re-employment rights in SCS. Under the PASA arrangement AID funds are made available to SCS, which assumes responsibility for performing a specific job abroad within the framework of AID policies and objectives.

### Watershed Project in Tunisia

In Tunisia the SCS has been engaged in developing a plan for a watershed above the town of Kairouan, some 100 miles south of Tunis, the capital, a modern city near the site of ancient Carthage.

The Oued Marguellil watershed comprises some 375,000 acres and stretches 60 miles from crest to outlet. Although it is semiarid land with a rainfall of only 8 to





**E. H. Graham, John H. Johnson, Leslie R. Albee, and Charles M. Hood in the Oued M'Silah subwatershed, Tunisia.**

10 inches, there is a heavy human population, about one person for every 2.5 acres.

Centuries of agriculture and grazing have resulted in severe erosion throughout most of the watershed, with floods causing heavy debris damage to the broad plain of the river above Kairouan, and occasionally to the town itself. There are large acreages in wheat and barley, and many orchards, mostly olives and almonds. Much of the area is heavily grazed by tended herds of livestock, especially sheep and camels.

Within the large watershed area, the Oued M'Silah subwatershed of some 4,300 acres has been mapped and planned in detail. Now that the general planning is completed, the Tunisian government is ready to employ, as relief labor, a force of men to develop rotation pasture plots in the north-central sec-

tion of the watershed, and to follow with the establishment of other conservation practices.

Nearly 40 proposed floodwater-retarding and water-management structure sites have been designated in the Oued Marguelli watershed area. The installation of land treatment measures will dominate the program in the watershed, however, until sufficient basic hydrologic and geologic data are available to determine the precise location of the structures and the Tunisian government feels it can justify the expenditure involved in building them.

To work with SCS technicians in the watershed, the Tunisian government has assigned two of its own men, college-trained in the United States. The onsite training of these Tunisians, working with experienced American technicians, may be one of the

solid contributions of the undertaking, for SCS personnel will phase out of the program within a few years.

### **Crew of Specialists**

More than 2 years ago John H. "Blackjack" Johnson, from the Ft. Worth Engineering and Watershed Planning Unit, went to Tunisia under SCS/AID contract, and the planning of the Oued Marguelli watershed area has been completed under his general direction. During this period, and even before, technicians had been made available for short periods through AID to assist with special aspects of the planning work.

Among the specialists who have worked on the watershed project are L. E. Derr, soil scientist from Oklahoma; John P. Alden from the Training Center at San Luis Obispo, Calif.; Louis Gottschalk and Roy G. Andrews, hydrologists from the Washington Office; Elco Greenshields, ERS economist; Louis M. Glymph, Jr., ARS watershed engineering research specialist; Clarence Haverland, geologist from New Mexico; M. P. Frank, E&WP Unit, Fort Worth, Tex.; Thomas Cowan, engineer from Texas; and Robert Dean, engineer from Montana.

With the return of Mr. Johnson to the United States in the spring of 1964, Leslie R. Albee, range conservationist from South Dakota, has taken over the leadership of SCS work in the country. He will be assisted by James Bower, soil scientist from Texas; Ralph White, engineer from Texas; and Louis Parton, soil conservationist from Oregon.

### **Conservation in Algeria**

The job SCS is doing in Algeria is different from that in Tunisia. Here, instead of planning a watershed, the effort is directed toward the application of simple conservation practices. These will not only serve as a demonstration of adapted U. S. techniques, but will



also provide employment for a large number of Algerian citizens.

The work is directed from Tizi-Ouzou, Orleansville, Tlemcen, and a fourth location still to be determined. A central headquarters has been established at the capital, Algiers, a metropolis of almost a million people on the Mediterranean shore.

Elvin Wickline from West Virginia is the project conservationist in charge at Tizi-Ouzou, Tom Dicken from Kansas is at Orleansville, and Frank Carr from Virginia is at Tlemcen, near the Moroccan border. Charles M. Hood from Missouri is program conservationist in charge of all SCS activity and is stationed in Algiers.

To assist the project conservationist in the field, four SCS specialists have been assigned to Algeria. They are Jesse McWilliams, plant materials technician from Wyoming; engineers Henry Gembala and Charles Walter from Nebraska and Montana; and soil scientist Sanford Anderson from the State of Washington.

The contract with AID was undertaken by SCS after John T. Phelan and Cal L. Roark of the SCS Washington Office had reviewed the situation in the spring of 1963. The first SCS personnel arrived in Algeria last summer.

### Work in Foothills

The work projects in Algeria are largely in the northern part of the country between the Atlas Mountains and the Mediterranean Sea, in a strip varying in width from 50 to 100 miles and rising to elevations of 6,000 feet. South of the mountains stretches the Sahara desert. Most of the work is in the foothills, but there is also some work in the better land of the valleys and uplands near the coast where grain, grapes, and citrus, and vegetables are grown intensively on land improved by the French. There is also some work in the higher mountains where remnants of oak, pine, and cedar

forests still persist.

All of the better land of the Mediterranean region was farmed by the Romans, and the ruins of their works and cities are still conspicuous features of the landscape throughout North Africa. Erosion is widespread and severe in the hills. The rainfall is higher than in the Tunisian watershed area—up to 30 inches or more in some sections along the coast—almost all of it falling during the winter months in typically Mediterranean fashion. The summers are dry and warm.

Soil conservation in Algeria under SCS technical supervision is accomplished through a public works program. The work is done by Algerians using handtools, each man receiving a daily wage consisting of cash, about 75 cents, plus a ration of American wheat and edible oil made available through Public Law 480 funds.

When I visited the projects in March of this year, about 1,000 men had just begun to work, although it is expected that tens of thousands will be employed before the summer is over.

The work consists of the construction of diversions, terraces,

outlets, irrigation canals, gully control structures, small dams, rock and brush removal from arable land, and tree planting. In addition, three nurseries for producing trees and other plant materials, once operated by the French, have been rehabilitated and several village water supply systems have been improved.

### Young Volunteers Help

A distinctive feature of the work in Algeria is the assistance provided SCS personnel by young men of the International Voluntary Services (IVS), an independent organization which has a contract with AID.

IVS, now in its 11th year, has some 200 college-trained men working overseas. At each of the Algerian project headquarters four IVS men aid the SCS project conservationist in planning and applying soil and water conservation practices. Trained in various fields—engineering, horticulture, biology, economics, forestry, etc.—these young men share a desire to live and labor abroad, a willingness to work long hours, and the facility for picking up French and  
*(Continued on p. 20)*



Elvin Wickline and Henry Gembala providing onsite instruction near Algeria.



# New Conservation Plants in the West

## Superior varieties and new methods increase farm and ranch income

By A. L. Hafenrichter

*Plant Materials Technician, SCS, Portland, Oreg.*

**N**EW plant materials are making millions of dollars for farmers and ranchers in soil conservation districts in the West. Thirty new plants are now in use that were unknown 25 years ago. Half of them are pedigreed and registered.

These new income-producing plants are the product of the Soil Conservation Service Plant Materials Centers. Each plant is tailored to do a specific conservation job. Their correct use depends on knowledge of conservation needs, proper land use, soils, and climate.

Just as engineers test new designs for automobiles, each new grass or legume runs the gamut of precise testing in a plant materi-

als center before it is put into general use. The testing program is especially designed to develop a good plant with dispatch but at high professional standards.

### **Lehmann Lovegrass**

Lehmann lovegrass is the best range grass yet discovered to seed semidesert grassland in poor condition. At least 1½ million acres in Arizona and adjacent States is range of this kind needing establishment of plant cover, according to the recently completed Conservation Needs Inventory.

Good stands of Lehmann lovegrass will produce 20 pounds of beef an acre. In contrast, similar land not seeded produces less than

10 pounds an acre. This difference applied to the 1½ million acres needing to be seeded would increase gross income by \$3 million annually.

Lehmann lovegrass is easy to establish with a minimum of seedbed preparation. Even if a sparse stand is obtained in a low rainfall year, the grass reseeds itself and comes to a good stand later. The grass was brought from South Africa and put into use by the Tucson, Ariz., Plant Materials Center.

### **On Saline Soils**

New plants combined with a simple means of correcting soil salinity pointed the way to increasing net income by \$75 million annually on 500,000 acres in California. Landowners are now producing 8,000 pounds of milk an acre annually where they claimed "It takes 40 acres to feed a cow" when soil conservation district directors requested assistance from the SCS.

The Pleasanton, Calif., Plant Materials Center worked out the method for correcting the saline-alkali conditions and used the new Goars tall fescue and Los Banos trefoil to produce consistently good pastures. The technicians recommended flushing off the salts because drainage was not feasible, then applying 3 tons of gypsum an acre. The fescue and trefoil were planted on good seedbeds in the fall, came up with fall and winter rains, and were fertilized



Lehmann lovegrass is seeded into low-producing rangeland with a pitting disk and seeder developed by the Tucson Plant Materials Center.



and irrigated the next season. Many plants were tried, but only Goars fescue and Los Banos trefoil gave consistently good yields.

### Success at Twin Falls

Necessity is often the mother of invention. This was the case in the Twin Falls Soil Conservation District in southern Idaho where a need for water conservation brought about a seed-production industry grossing \$125,000 annually. At the same time rangeland was being seeded as rapidly as ranches could be planned and sites selected. Good grass has increased land values from \$4 to \$20 an acre.

Water conservation was the first objective of the Twin Falls district. Irrigation water was plentiful in the spring but often short by midsummer. The Aberdeen, Idaho, Plant Materials Center had produced a superior new grass for range seedings, Siberian wheatgrass, but the seed supply was short. SCS technicians knew that good seed crops of the new grass could be produced with much less irrigation than alfalfa hay, potatoes, or beans. The district began growing seed, and success was immediate. The number of growers increased rapidly.

In the meantime, sagebrush was cleared on adjacent rangeland and Siberian wheatgrass was seeded there. It was well adapted to the Sierozem soils, produced 30 to 50 pounds of beef an acre, had a longer green-feed period, and was more digestible than other grasses commonly used. The use of Siberian wheatgrass is spreading to adjacent States.

### Alternate-row Seedings

New and otherwise good plants often require new methods to get good ground cover and good production. Cascade birdsfoot trefoil planted with new varieties of orchardgrass makes a superior soil-improving crop and produces good hay, silage, and pasture. But the seedlings can be crowded out by



Dairy cows produced 8,000 pounds of milk an acre on this Goars fescue-Los Banos trefoil pasture on reclaimed saline-alkali land.

an aggressive grass before they are established. The same result is often obtained with Ladino clover. The Corvallis, Oreg., Plant Materials Center worked out a way to overcome this difficulty. It simplified the alternate-row seeding method, which can also be used for seeding alfalfa-grass and Ladino clover-grass mixtures.

A grass and a legume can be seeded in alternate rows with any farm drill in good repair. Card-board partitions are installed in the grain box, and the two kinds of seed are put into alternate compartments. The grass seed and the legume seed are mixed separately with rice hulls in correct proportions to plant the right amount of each with one setting of the drill.

Hundreds of acres are planted

by the alternate-row method each year. The value of being able to get consistently good stands is hard to estimate. The saving in seed alone is a substantial figure because the alternate-row method requires at least one-third less seed an acre.

### A Vetch for Range

Miracle once-in-a-lifetime plants do occur. Such plants are often overlooked, but trained plant materials technicians who are aware of a major need for land treatment quickly "spot" them. Lana woollypod vetch was discovered in this way by the Pleasanton Plant Materials Center.

Lana vetch is the first really successful legume ever developed for use on western rangeland. Ev-



every grassman and livestock producer knows that an acre of range feed containing at least 30 percent of a reliable legume will produce more meat than grass alone. Range conservationists have been searching for such a legume for years.

Lana vetch consistently doubles the forage production when seeded on annual grass range in California. When rainfall is less than 16 inches, average production with Lana vetch is 1,600 pounds of air-dry forage an acre; without vetch, 800 pounds an acre. When rainfall is more than 16 inches, the corresponding figures are 2,000 and 1,000 pounds. These figures represent an increase of about 35 to 40 animal-unit-days of feed attributable to the use of vetch.

The Conservation Needs Inventory indicated that there are 5 million acres of foothill grazing land where Lana vetch can be used. If only half of it were seeded, and beef cattle on it gained 1 pound a day, the additional annual income attributable to the vetch would be between \$17½ and \$20 million. Allowing for the cost of fertilizer needed to maintain the vetch in vigorous condition so it will reseed—9 pounds of phosphorous (40 pounds of  $P_2O_5$ ) an acre annually—the increased net

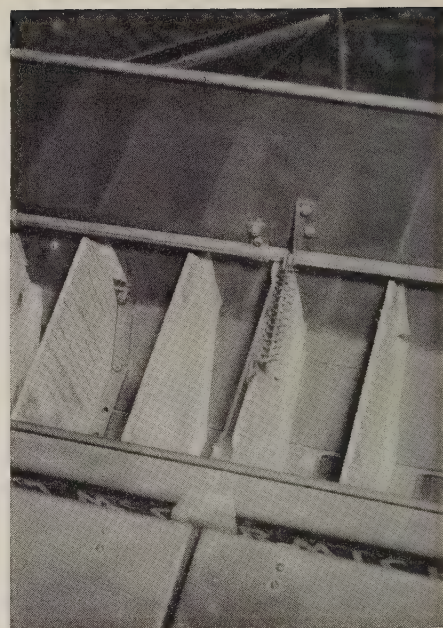
income from Lana vetch would be at least \$10 million.

Lana vetch has other uses. Increased income from these uses is substantial but has not yet been calculated. For example, a combination of Lana vetch and a grass—Blando brome—makes an excellent self-seeding cover crop for orchards and a successful bank stabilizer in small watershed projects. Both mourning doves and quail relish Lana vetch seed and gather in large numbers where the legume is grown. Sportsmen prefer those fields for hunting.

### Quality Forage

Latar orchardgrass, a new variety “spotted” by the Pullman, Wash., Plant Materials Center, yields as much forage an acre as any other orchardgrass variety, and pound for pound contains 10 percent more digestible nutrients. This was determined in feeding trials by scientists of the cooperating Washington Agricultural Experiment Station.

Orchardgrass is widely adapted to farmland in cool, temperate climates. It has many uses in conservation work, being used to stabilize soil to improve soil tilth, and to produce hay, pasture, and silage. It is usually planted with a leg-



Simple dividers of heavy cardboard or plywood are held in place in the grain box of a drill to make alternate-row seedings of grass-legume mixtures.

ume and is especially desirable for use with alfalfa for hay and silage and with trefoil or Ladino clover for pasture.

Latar orchardgrass was released for use in 1957, and 6 years later more than 100,000 acres were reported from farms and ranches in the West. Its potential monetary value, if used on only half the land to which it is adapted, has been estimated at \$21 million a year.



Irrigated pasture containing Latar orchardgrass and Vernal alfalfa produced 1,000 pounds of beef an acre.



# Mud River Watershed

**Award-winning project gives Kentucky towns water supply, recreation, industry**

ON JUNE 2 of this year, Jewell Graham of Lewisburg, Ky., opened the valve of a new fire hydrant and released the first bursting spray of water into a city street. The ceremony ended dependence on unreliable "salt and soda water" private wells for 192 eager Lewisburg customers. It also chalked up another victory for an expanding community effort known as the Mud River Watershed project.

A month earlier the four-county Mud River watershed was proclaimed winner of the National Watershed of the Year Award at the 11th National Watershed Congress held in Little Rock, Ark. Jewell Graham, who is chairman of the Mud River Watershed Conservancy District and also president of the Kentucky Association of Soil Conservation Districts, accepted the award "in the name of the 1,600 farmers of Logan, Muhlenberg, Todd, and Butler counties who made the program possible by cooperating in its land and water conservation practices."

The citation for the award tells the story:

"In a prize essay in 1955 a Kentucky schoolgirl by the name of Ernestine Williams described the plight of the flood-plagued watershed on which her father's farm is located and proposed a cure. She wrote 'In soil conservation practices man and Nature join hands as friends and work together to rebuild God's earth as He intended it to be.'

"As it turned out, this was precisely what happened on this 240,-

000-acre watershed. Sixteen hundred farmers . . . joined hands to tame the unruly Mud River and applied for assistance under Public Law 566.

"The Mud River Watershed Association was formed at the same time. Armed with enabling legislation, farmers were joined by citizens in towns and cities to form a Mud River Watershed Conservancy District.

"Under Jewell Graham, the conservancy district obtained 160 easements from farmers and corralled support from bankers, editors, business and professional men, and county and State officials.

"The watershed work plan that was approved for Mud River called for 24 floodwater-retarding structures (all but 8 now completed), 2 multipurpose structures, and 17 miles of channel improvements as well as accelerated land treatment.

"A dam for what has proved to be a jewel of a lake in a green Kentucky setting, Lake Malone, was completed in 1961 and offers 900 acres of water for recreation in addition to flood protection.

"The State and the Soil Conservation Service split the construction cost of the lake. Lake Malone is already providing 15,000 man-hours of fishing annually, which attests to the acumen of local sportsmen who purchased the land for impoundment and deeded it to Kentucky. A \$45,000 sportsmen's lodge has been built on the lake. A new State park will entertain upwards of 1 million visitors a year.

"Sites for more than 250 summer homes have been sold, of which



Jewell Graham, chairman of the Mud River Watershed Conservancy District, opens a Lewisburg, Ky., fire hydrant to release water from a floodwater-detention structure. City officials watch the ceremony heralding arrival of city water to replace individual wells.





Nolen J. Fuqua (l.), Watershed Man of the Year, watches as Jewell Graham (r.) accepts the Watershed of the Year award for Mud River watershed sponsors from James B. Craig, master of ceremonies at the 11th National Watershed Congress. (Arkansas Gazette photo.)

100 have been constructed. Three boat docks have been built, 40 miles of roads and a new \$154,000 bridge provided by the State. Interest in a second multipurpose dam and reservoir for Lewisburg's water supply was sparked by that city's Lions Club.

"The city bought land for impoundment and a grant and loan from the Area Redevelopment Administration was secured for installation of the water supply system. The dam was completed in 1963, and the water system will be in operation by early summer.

"A new factory employing 75 persons is one direct result of this new water system, and Mayor Marion Price Pitt estimates a total of 170 new jobs are being brought to the community.

"On the land itself, 87 percent of the planned conservation practices have been carried out. Nine

hundred acres of stripercopping have been installed and more than 500 acres of grass waterways established. The Forest Service has assisted with the planting of more than 750 acres of trees. Pasture planting and cover crops may be seen everywhere."

This is not all of the citation. Lengthy as it was, it could not hope to describe the local volunteer effort that went into the Mud River project nor the effect on the local economy.

The Mud River watershed is mainly agricultural, but includes several small towns, the largest of which is Russellville with a population of 8,500. The area has a long history of water problems—too much or too little. Crops worth millions of dollars have been buried or strangled in swirling waters of recurring bottom-land floods. Road and bridge damages added

to the costs. And while bottom-land farmers struggled with high water problems, families in the uplands worried about water shortages. Even moderate droughts brought dry wells. With no body of water of any size within a hundred miles, water-based recreation was practically nonexistent.

This has also been an area of job scarcity. Nothing attracted industries but the availability of labor, and other handicaps outweighed this advantage. Young people, on and off the farms, have had to find jobs in distant cities.

Bringing a watershed project into the community was like breaking a log jam. Local residents began to feel a new freedom and spirit of adventure. They decided this was something good and they wanted to make the most of it.

Here are some examples:

When Bob Guion, manufacturer of laying crates and prefabricated "hog parlors" at Russellville learned that Lewisburg was impounding water for its use, he decided to set up a branch plant there. His new business is now hiring 75 persons.

When Clyde Baugh, another young Russellville businessman, saw that the 900-acre "dream lake" of local sportsmen was to become a reality, he started a boat shop. His powerboats are now skimming the waves on this popular recreational lake.

The Emerson Electric Company constructed a \$4 million plant at Russellville to make fractional motors. It hires in the neighborhood of 500 persons. The watershed project was one of the important considerations in its location.

The Rockwell Manufacturing Company of Russellville plans to greatly expand in the next few years and already employs more than 300 persons. The Mud River project will reduce silting in the city's reservoir and will provide an auxiliary source of water for



the industry if it is ever needed.

B. M. Stuart, chairman of the Russellville-Logan Chamber of Commerce Industrial Committee, said recently that local plants with the largest payrolls are the ones that feel the effects of the watershed program most. He estimated the combined payroll of the five largest at \$3 million a year.

Besides protection to crops, area farmers are gaining efficiency in use of their land, says L. J. Northern, local conservationist with the Soil Conservation Service. And Logan County Agent Aubrey Warren asserts he now finds it easier to gain acceptance of an intensified livestock feed production program which he hopes will raise Logan County's income by \$4 million a year.

Macon Brown, vice chairman of the Southern Deposit Bank, reports that loans and deposits have increased 25 percent in the past 5 years with a high proportion tied to land improvement in the watershed—loans to buy seed, reclaim land, get bulldozer work done.

One of the biggest boosters of all has been Al Smith, editor of the *News-Democrat* at Russellville. He claims the educational aspects of the watershed project have been of tremendous value.

Mud River thus takes its place with other multiple-purpose watershed projects where local people through initiative and imagination are breaking the log jams of undeveloped soil and water resources. Those who have shared in this and other similar ventures will agree they provide a "new frontier" of opportunity.



More than tripling in number since 1957, cooperative soil survey reports published by the Soil Conservation Service are used by farmers, builders, land appraisers, planning agencies, and highway engineers.

## Bicolor Guards Rights-of-way

TALL pines and powerlines are not compatible. But quail and bicolor and utility rights-of-way make a happy combination.

That was why the Blue Ridge Electric Cooperative, Inc., of Pickens, S. C., has been an active participant in the Twelve Mile Creek Pilot Watershed project for several years.

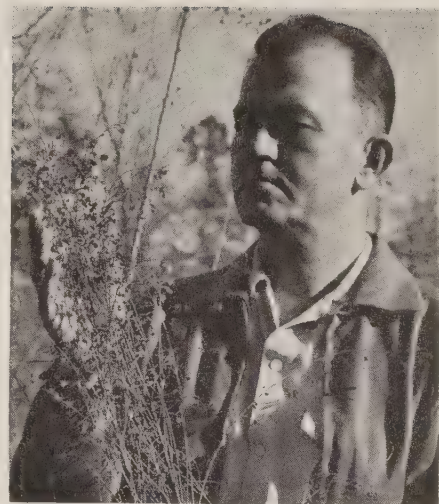
As part of the watershed program, farmers were planting eroded fields and idle land to pine trees but had to skip the long strips of utility rights-of-way across their farms. Each strip was becoming a new critical area, a source of fast rainfall runoff, and each contributed sediment to the stream channels and reservoirs. Because the farmers were working desperately to stop the many critical areas they already had, they didn't want any more.

To solve the problem, Work Unit Conservationist F. G. Lindsey of the Soil Conservation Service took a tentative solution to Cooperative Manager A. J. Hurt. Heretofore, farmers had liked shrub lespedezas, japonica, and bicolor and had planted small plots on several farms. With a little encouragement, he said, they might agree to protect the rights-of-way with these plants.

The cooperative agreed to furnish fertilizer for the plantings, the South Carolina Wildlife Resources Department agreed to supply as many plants as they could, and the Pickens Soil Conservation District agreed to handle both materials.

The project got underway in 1953 and by 1957, 101 acres had been planted to this favorite quail food. Most of the rights-of-way are now protected but the program continues, Lindsey reports.

Each year the district distributed 50,000 to 75,000 plants—as many as were available from the



Bicolor seed shatter throughout the winter, providing feed for quail. Soil Conservationist Paul Hollis inspects crop in Twelve-Mile Creek watershed.

wildlife department. Most of them went on the potential trouble spots on utility rights-of-way.

Clyde Chapman, who planted 1,000 feet of right-of-way in 1957 at the rate of 8,000 plants to the acre, reports a great increase in the native quail population. A pair of Japanese quail that he released several years ago has now multiplied into many coveys.

## Windbreaks and Wildlife

Harold Gallaher, Extension forester at Kansas State University, reports that windbreaks do more than break the wind. Trees used in windbreaks produce seed, berries, and fruit for wildlife during cold weather, serve as nesting places for some birds, and provide cover and protection from predators and severe winter weather. A combination of a row or more of red cedar and a row of Austrian or ponderosa pine is the "backbone" of a winter windbreak in this area.



• **Ownership of Rural Land in the Southeast**, by Roger W. Strohbehn, 1964. Agr. Econ. Rept. 46. 43 pp., illus. The pattern of rural ownership is revealed by interviews of 2,643 landowners.



# New Hope for Sunset Community

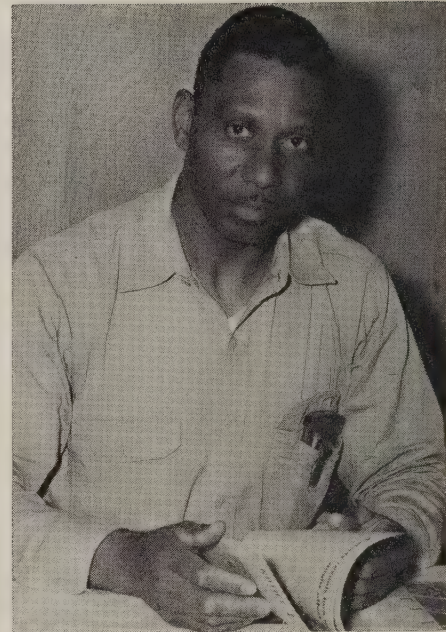
## Rural people, agencies work together to develop resources

**T**HE Sunset Community, about a half mile outside the city limits of Marion, Ark., is a good example of how the Soil Conservation Service and other agencies are cooperating in eastern Arkansas to advance Rural Areas Development and give assistance to underprivileged rural families.

Soil Conservationist Chester Durley has helped the local people make plans, and SCS technicians have completed surveys in the Sunset area. Work will be underway

soon to solve water problems.

The area is within the Crittenden County Soil and Water Conservation District and is typical of several similar communities in the district. Sunset has a population of 103 families, all of whom work on farms as day laborers or crop-pers. In the area where they live there is a continuous problem with water. As one resident put it, "We have a problem when there's lots of rain and a problem when there isn't any."



**Chester Durley.**

*"During recent months," says Chester Durley, "I have made a special effort to work with land owners and operators to preserve the family pattern in agriculture. I have tried to coordinate my efforts with those of the Farmers Home Administration representatives, Extension personnel, county health workers, and vocational agriculture teachers to help disadvantaged, low-income farm families. I am receiving tremendous personal satisfaction and believe this special effort and assistance on the farms and with these farm families is very beneficial."*

### Poor Drainage



Standing water for weeks after a moderate rain was a common occurrence, as in the above picture where T. C. Green (r.) president of the Sunset Citizens League, discusses the situation with W. C. Potts, secretary. Representatives of the community approached SCS technicians and after explaining

their plight requested a preliminary drainage survey. The survey revealed that culverts leading under a nearby highway are too high, thereby blocking the outlets. The water backs up shoe-top deep in most yards after 3 or 4 inches of rain and remains until it is absorbed or evaporated.

Chester Durley, soil conservationist, has been with the Soil Conservation Service since December 1951. He also worked with SCS on a land utilization project in 1941 at Tuskegee, Ala., as an agricultural aid. Between 1950 and 1951 he was assistant county agent, Agricultural Extension Service, Clarendon, Ark. He received his B.S. degree in agriculture from Arkansas A.M.&N. College and an M.S. in agronomy from Michigan State University.



## Water Shortage



Periods of water shortage present other problems. There is no water with which to combat fire, and the Marion City fire trucks often are too late to be effective. Good health is endangered because many residents get their water from shallow wells which yield unsanitary, brownish water. Others haul water by can or barrel from some distant source for drinking and bathing. Mrs. Teresea Person, above, pumps water from a shallow well to be used after being treated with lime.

With SCS encouragement residents of the community organized the Sunset Citizens League. The county had already been declared eligible for Area Redevelopment assistance. The Citizens League received an FHA loan of \$35,000 to install a water system. When this job is completed a drainage and sewer system will be developed to relieve the community of flooding and pollution.

## A Recreation Lake

Northwest of the Sunset Community, near Crawfordville, the SCS and Agricultural Stabilization and Conservation Service are assisting in a Rural Areas Development program calling for conversion of 350 acres of cropland to a lake and recreation area. The project is being developed by the Alpe brothers and is the largest of 10 such projects in the State. Ultimate objective is to have this unit furnish the urban and rural population of the surrounding area one of the top recreational facilities in eastern Arkansas and western Tennessee. It is a 5-foot deep lake suitable for just about any type of water sport. Water to fill the lake is pumped from a deep well (below).

Present plans call for the grand opening July 4, 1965. The lake will have almost a mile of sand beach fronting. It has already been stocked with fish, and about 10 acres of surrounding property will be in picnic and parking

areas. The Alpe brothers received an adjustment payment of \$10,000 from the Government to help maintain their income while converting the 350-acre tract from crop production to a recreation area under the provisions of the cropland conversion program.

ASCS participated in the cost-sharing program on all earthwork. SCS furnished all technical assistance, such as soil interpretations, engineering surveys and designs, agronomy and biology information. About 18 acres of bermudagrass has been seeded to protect the levees and improve the picnic area.

SCS technicians report much enthusiasm among Sunset residents as they anticipate ultimate benefits from the onsite assistance of USDA agencies. The working agreements developed locally enable each agency to make its maximum contribution to the common goal. — OTIS THOMPSON, *information specialist, SCS, Washington, D.C.*





# Agencies, Landowners Join Efforts to Improve Ditch

By Richard W. Rush and William F. Brown  
*Work Unit Conservationist and Conservation Technician, SCS  
Chillicothe, Ohio*

THE Soil Conservation Service cooperated with other agencies of the U. S. Department of Agriculture to help a group of Ross County, Ohio, farmers solve a costly drainage problem. Source of the problem was a plugged outlet ditch that caused concern for landowners in Ross and Pickaway counties.

Farmers and representatives of public organizations from both counties held a meeting in February 1963 to discuss what could be done about the problem. Public officials urged that any action be a cooperative effort of neighboring farms rather than that of a legal drainage district organization. The cooperative method would save time and allow the group to take

advantage of the Agricultural Conservation Program cost-sharing.

The farmers organized the Holderman Ditch Improvement Association. They requested ACP cost-sharing from the Ross ASC Committee and SCS engineering assistance from the Ross Soil and Water Conservation District. Both requests were approved. The county commissioners and county engineer also cooperated.

SCS made a survey of the ditch and recommended that five laterals draining into the Holderman Ditch be deepened. As much as 3½ feet of earth needed to be taken out of the ditch. A total of 5.6 miles of ditch needed to be deepened and widened requiring 22,200 cubic yards of earthmoving.

The farmers questioned whether the outlet ditch would become silt-filled again once it was cleaned. They were told that most of the upland landowners were cooperators of the Ross and Pickaway soil and water conservation districts in the 11,736-acre watershed with basic soil conservation farm plans developed and applied. This would reduce silt movement from the watershed to the ditch, and they could realize full benefit of their investment as well as lower maintenance costs.

Because examination of a soil survey map showed 11 farmers and 1,050 acres would benefit most from the drainage, cost of the improvement was divided among them. All agreed this was fair and accurate.

On September 16 the bids were opened and the contract awarded. Construction was started October 1, and the contractor was able to complete the job by December 1. A dragline with ¾-yard bucket was used. Fifty percent of the spoil was spread in the fall and remainder was completed in the spring.

Wayne Cryder, manager of the association, said the cooperation shown in the Holderman project is essential in solving soil water conservation problems either with groups or individual landowners.

USDA-California Experiment Station studies showed that annual range plants treated with moderately high applications of nitrogen and phosphorus produced a more extensive root system and used moisture four times more efficiently than did untreated plants.

Grazing of livestock in shelterbelts can spell destruction for the trees, and the feed the animals get usually is of poor quality.



The ditch deepening project is viewed by a group of farmers who have similar problems in their own community.





Spoil bank on right side of Chippewa River as it passes Benson, Minn., illustrates the shape and position used in large floodways of this project.

# Large Floodways Present Problems in Construction

By James R. Fisher

Project Engineer, SCS, Montevideo, Minn.

**M**OVING unusually large quantities of earth presented unique problems in both design and construction of the several large floodway channel improvement jobs in the pilot watershed project in western Minnesota.

The three subwatersheds of the Chippewa River Tributaries and Hawk Creek Watershed Protection project have floodways totaling 139.5 miles in length and requiring nearly 10 million cubic yards of

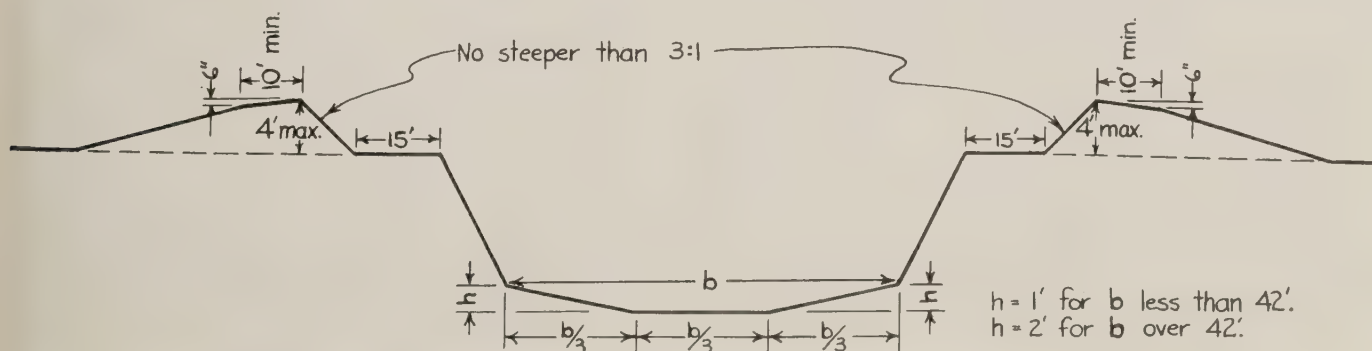
excavation. Channel depths average from 6 to 9 feet and some reach 25 feet. Channel bottom widths range up to 70 feet on the Shakopee and Hawk Creek floodways and up to 140 feet on the Chippewa River improvement.

The large channels were needed to contain expected storm flows within the banks. The necessary width, however, created a problem in handling the smaller normal flows. The latter could be expected

to meander across the wide channel bottoms and cut secondary channels in them. It was decided, therefore, to use a parabolic (or saucer-shaped) channel section with a tapered shelf on either side. Lower flows would then be contained in the center of the floodway and the shelf along the toe of each bank would prevent scour. The shelf would also permit better growth of vegetation between floods.

Contractors had no difficulty in digging channels of this shape. Later checks show that they are keeping their designed shapes.

Another feature of these large channels was a 15-foot-wide berm of undisturbed earth along each side. Excavated material was re-



Typical cross section of floodway showing shape of channel bottom and spoil banks.

quired to be placed outside the berms, thus preventing any of it from being washed back into the channels. This also places the spoil piles far enough away from the newly cut banks to avoid sloughing, as commonly happens when the quantity of excavated material is large as it was on these jobs. The berm serves as an access route for regular maintenance inspections and provides room for machinery to perform any necessary maintenance work.

In Minnesota, spoil piles usually are not leveled until the season after excavation. Most excavated material is saturated and needs considerable time to dry. Good drying weather occurs mainly from May to October.

A slope no steeper than 3 to 1 was specified for the channel side of the spoil to allow for satisfactory seeding and mowing of the banks. A 4-to-1 slope was required on the landward side. Also, the top of the inner slope was made the high point of the spoil. A 10-foot top width with a 6-inch slope away from the channel was required to avoid a "peaked" spoil-bank that would be difficult to maintain. Any water falling outside the crest would flow away from the ditch and enter the floodway at intervals through pipe inlets or sod chutes.

Many special problems arise when very large floodway channels are routed through urban areas. The Chippewa River improvement passed through Benson, Minn., near the sewage treatment plant. The channel in this area had a top width of 165 feet. During the planning stage, meetings were held with the city council so that the alinement route and other work would be familiar to them. Planned protection for existing sanitary and storm sewer outlets was explained.

When feasible, recommendations of the council were incorporated into the plans. For example, the city had hired a consulting engi-

neer to make recommendations for enlarging the sewage treatment plant. The consultant, through the council suggested that about 7,000 cubic yards of excavated material be stockpiled in a designated area for use during the remodeling of the plant. It was possible to incorporate the proposal into the plans, and a special note was placed on the plans to this effect.

Farther upstream, the best possible alinement could be achieved only by routing the floodway channel through the municipal golf course, requiring reorganization of the course layout. In order to avoid depositing excavated material on the fairway sod on remaining portions of the course, the contractor agreed to excavate material in two passes from the oppo-

site side of the channel. There was good cooperation between city workmen and the floodway contractor during this hauling operation. The city needed fill material and furnished the trucks for hauling. The contractor arranged his schedule so that he could load them at their convenience.

Machine time was not devoted to earthmoving alone. Grubbing of large cottonwood and elm stumps slowed progress. Additional time was consumed while working near powerlines and when making highway crossings. Earthmoving in urban areas presented special problems that required flexible scheduling. Suitable solutions were found, however, and the floodway channels are now functioning as they were intended.

## Lazy 6 Lakes Fishing Area Brings Cash, Fun for Owner

**T**HERE is lots of excitement around the Lazy 6 Lakes fishing area these days.

Hundreds of people have caught bluegill, bass, channel catfish, and carp, some weighing up to 11 pounds or more. These fish were caught in the ponds developed for recreation by Mr. and Mrs. DeLos Six and his mother, 10 miles southwest of Hillsboro, Ill.

Lazy 6 Lakes did not just happen.

The Six family purchased a badly rundown 110-acre farm in 1953. Six asked the Montgomery County Soil and Water Conservation District for help. Lex Xanders and Howard Brown of the Soil Conservation Service helped him develop his conservation plan and lay out practices to control erosion, including a pond for live-stock water and a 7-acre lake where a large gully was dammed.

DeLos Six was not satisfied with the usual farm conservation program. He believed that farming and recreation could go together and provide additional income.

After visiting similar projects in Illinois and Indiana, he stocked his lake with fish, built camp grounds and picnic areas, and installed other essentials including a well, store, restaurant, bath-houses, and swimming beach.

The Sixes opened their recreation area in June 1963. Within 4 weeks, more than 2,000 people had been paying visitors. People came to fish from as far as 60 miles away. More than 250 spent at least 1 night camping.

Six estimates that he and the family spent not more than 10 percent of their time meeting, directing, and helping the guests.

In addition to what these people paid to enjoy the facilities of Lazy 6 Lakes, they also bought gasoline, food, fishing tackle, and other supplies from local merchants. This amount of added business could not be recorded but probably was several times what was spent at Lazy 6 Lakes—**DELBERT E. JACKSON, work unit conservationist, SCS, Greenville, Ill.**



# Camp Conservation Wins Scout Council Award

**O**F ALL kinds of soil and water conservation work, tree planting is the chore the boys remember. It's the remembering that counts."

This is Ranger Sidney O. Stephens of the Charles Howell Scout Reservation near Brighton, Mich., talking. For more than 20 years he has nurtured the conservation conscience of thousands of Scouts who, in turn, have made his 654-acre domain into a conservation showplace. Their remembering provides the donations, the volunteer help, and even the endless stream of new Tenderfoot Scouts.

Every Scout seeking a forestry merit badge is required to plant 100 trees during his stay at camp. Over the years, Scouts have planted 200,000 trees and shrubs.

The Detroit area council has just been awarded one of the coveted USDA Council Conservation Awards, given to only one coun-

cil in each of the 12 regions of the United States. The brief of accomplishments, filed with the award committee, is devoted mainly to the activities of the Scout reservation. Ranger Stephens himself, earlier this year, received a Certificate of Merit award from the Soil Conservation Society of America, Michigan chapter.

The USDA award, given mainly for 1963 activities, recognizes that conservation is not a 1-year affair. There is planting and replanting and a constant building and rebuilding of facilities with an eye to the future and the welfare of new generations of Scouts. With 20,000 boys using the reservation each year, maintenance alone becomes a terrific problem. Yet nowhere is "overgrazing" apparent.

Things were different a quarter of a century ago. When the original tract of land was acquired, the fields were bare, the soil poor,

the slopes scarred by erosion. Trees were scattered and few.

Robert R. Scrase of Southfield, Mich., an early Scout, describes it thus:

"I remember it like it was just last summer. The Scout reservation was nothing but a rolling section of land covered with dry, brown field grass that July in 1938. You could practically see from one end of the reservation to the other—if the hot, dry wind wasn't blowing sand in your face. To a Tenderfoot this was really it. This was the wilds of the Sahara—the burned out Western Plains—the Pampas at its worst.

"On December 1, 1963, I saw the results of 26 years of continuing conservation in action. Today, thousands upon thousands of stately fir trees stand in grove after grove, hillside after hillside, valley after valley—where once there were barren, dry burned grass and ground."

Scrase could have added that the land is now teeming with wildlife—deer, rabbits, raccoon, opossum, squirrels, ruffed grouse, quail, part-



At a waterfront campfire, "almost real" American Indians return to remind their paleface brothers of the need to carefully conserve natural resources.





**Ranger Sidney Stephens (l.) shows honeysuckle and other wildlife plantings to Lamar Wood, formerly SCS work unit conservationist. This was a bare, blow-sand area when the Charles Howell Scout Reservation started its conservation program.**

ridge, and pine finch. The attractions for songbirds include hundreds of individually built birdhouses.

The Charles Howell Scout Reservation, a cooperator with the Southeast Livingston Soil Conservation District since 1942, is regularly used as a site for the district's annual meetings. The Soil Conservation Service through the district has given much technical help and advice, with other agencies, particularly the Michigan Department of Conservation, also contributing.

A soil and water conservation plan spells out the uses of each acre of land to get the most from the light sandy soils and the few muck areas. The 85 scattered acres of tree planting, the 60 acres of pruned pine plantations, the wildlife plantings, diversion terraces, stream improvement, the 5 miles of firebreaks, the 12 miles of exciting nature trails, the development of shorelines and swimming areas — all have a lot of

“know-how” from professional conservationists mixed in with the youthful vigor and enthusiasm of the Scouts.

One of the biggest engineering projects was the new swimming area recently created on spring-fed Lime Lake. SCS engineers recommended 500 cubic yards of excavation to give a beach 200 feet long, sloping gradually out to a 4 foot depth 40 feet from shore. Afterwards, 2,000 yards of sand and gravel were put in to cover an undesirable marl bottom. All together \$2,500 was spent to make this a top-notch swimming lake.

Many private agencies and individuals have helped. Ranger Stephens tells of a painting contractor who brought his whole crew of men out and worked all day Saturday and Sunday without pay. This spirit of the Scout's “good turn” is a part of the good neighbor policy that has won friends and built a reputation of excellence for the Scout reservation.

For example, Scouts regularly collect pine cones and forest litter for free use by the Michigan State Forest Nursery nearby. They also cut and load Christmas trees which are donated to various social agencies, schools, and churches.

“Our job,” says Ranger Stephens, “is to teach boys to treasure our forests and water, our wildlife and soil, not only for their real value, but because they are necessary to our way of life, to our economy, and to our spiritual well-being.”

## Exhibits Feature Conservation at Scout Jamboree

Three identical conservation demonstration areas were a major attraction at the Sixth National Boy Scout Jamboree at Valley Forge Park, Pa., July 17 to 23.

More than 50,000 Scouts, Explorers, and leaders had an opportunity to view the exhibit.

The Soil Conservation Service helped prepare the demonstrations and man the 10 instruction stations in each of the 3 areas. About 75 men representing more than 20 Federal, State, and private conservation agencies and industries served as onsite instructors.

Subjects covered in the conservation program, among others, included soils, watersheds, forestry, geology, weather, range management, marine resources, and wildlife. The theme of the entire program is “Conservation — Your Community and You.”

Scout leaders consider the jamboree an outstanding display of Scouting spirit and discipline and a demonstration to the entire world of American democracy. Conservation was emphasized as an obligation of American citizenship, as it was in the jamboree of 1953, 1957, and 1960.



# Farm Pond Serves Fire Protection And Recreation

(Photo on back cover)

**A** FARM POND as a measure of protection against fires has proved its worth for a northeast Washington farmer, who shortly after his pond was completed, saw lightning set fire to a section of his 170-acre timber stand.

Fire fighting crews were able to bring the blaze quickly under control and a \$280 investment in pond construction paid off for the farmer by limiting to a minimum damage that might have reached \$5,000.

William "Bill" Jolley, a cooperator in the Kettle-Stevens Soil and Water Conservation District, is the farmer who followed through on his idea of a fire protection pond.

It was Jolley's contention that while farm ponds for livestock, irrigation, and erosion control are important parts of soil and water conservation programs, a pond as a source of water for fire fighting would be a vital utility also.

Jolley consulted with Soil Conservation Service technicians who went over his farm, drew up a plan, and provided engineering supervision for the job. He received financial help through the Agricultural Conservation Program.

The job was begun in the spring of 1962. The pond-site was located where a spring-fed stream near the farmhouse could supply the water. Jolley hired a dragline and a tractor with a front-end scoop to move and spread 550 cubic yards of soil. An inexpensive overflow culvert was installed to take care of excess water. By summer the job was completed.

When filled the pond was a beautiful addition to the farm scenery. It was enhanced by a

footbridge built at a cost of \$100. Further pleasure was provided the Jolley family when the pond was stocked with trout.

SCS technicians in Stevens County believe the fire pond idea

is a good one for other farms. They expect to be called to assist with several more within the next few years—LENN DOMPIER, *work unit conservationist, SCS, Davenport, Wash.; formerly of Colville.*



## CONSERVATIONISTS ALL

As one conservationist to another, State Conservationist Keith F. Myers of South Dakota presented the Hornaday Award to Eagle Scout Jeff Harms in a recent ceremony in Huron, S. Dak., witnessed by Jeff's parents, Mr. and Mrs. Ellwood Harms.

The William T. Hornaday Award for distinguished service in conservation is given by the National Council of the Boy Scouts of America in cooperation with the New York Zoological Society. The engraved medal is awarded only in cases of truly distinguished achievement in conservation.

Jeff Harms packed abundant

experience in conservation and other scouting interests in the years since he became a Cub. He was an Eagle Scout in 7 years, and in the next 2 years he earned Bronze, Gold, and Silver Palms. He has his "God and Country Award" and is working on a second Silver Palm.

He has earned 38 merit badges in all, and he credits those in conservation with helping him to choose his life's work, that of a forestry biologist. He got his early interest in conservation from his conservation-minded father, a commercial nurseryman.



# SCS Goes Abroad

(continued from page 5)

Arabic which enables them to get along with the local leaders and youth in the villages and the workers in the field. The Algerian government also provides aides to assist with the application of practices on the land.

## SCS Personnel Terms

With respect to SCS personnel, anyone who is assigned a job abroad receives, before he leaves the United States, a thorough orientation in the manners and customs of the region to which he is being assigned as well as basic training in the language of the country.

Such an assignment usually commands an increase in grade and sometimes carries a post differential involving a percentage salary increase related to increased cost or hazards that may exist in the foreign headquarters. There are also allowances which normally cover rent, education for dependent children, and the like.

SCS people I visited in both Tunisia and Algeria were comfortably situated in houses or apartments, nicely furnished by the U. S. Government in modern style.

The United States considers the AID program an important arm of foreign policy. In recent years more than \$2 billion has been budgeted annually for economic and assistance programs.

Although the United States seems to be spending a great deal in its foreign aid program, we are now spending a lower percent of the Federal budget on foreign aid than we were several years ago. We are also spending proportionately less than some other countries, measured in percent of Gross National Product. A large proportion of the funds is for loans payable in dollars.

Funds available for technical assistance in recent years have

permitted some 3,500 technicians to work overseas annually. More of these men—some 700 plus—work in food and agriculture than in any other field, such as industry and mining, health and sanitation, or transportation.

American aid to foreign countries in the various aspects of agriculture is being more closely coordinated. Special efforts are being made to achieve stronger cooperation between AID, USDA, and the land-grant institutions.

In the last analysis, all phases of agriculture, including plant and animal disease control, research, marketing, credit, extension and the use and management of soil and water resources are closely related to each other and to the total economic and social needs of the country that has requested assistance.

How much soil and water conservation will be included in technical assistance programs abroad in the months and years ahead is difficult to surmise. Certainly no agriculture can remain sound without full attention to the basic natural resources upon which production depends.

## Girl Scout Cookies Dedicate Lake

A tubful of Girl Scout cookies—not champagne—was used to dedicate the “Sweetest Lake in the World,” described in the May issue of *Soil Conservation Magazine*.

The 73-acre lake in the Porter Creek watershed in Tennessee was formed by a structure paid for in part by funds contributed by the Tennessee-Arkansas-Mississippi Council of Girl Scouts. The Scouts raised the money by selling 300,000 boxes of cookies.

SCS Administrator D. A. Williams participated in the dedication on May 24, before a crowd of 35,000 people. Governor Frank Clement and State Conservationist

J. R. Sasser were speakers.

“I christen thee Lake Okalowa,” said Kay Tankesley of Troop 91, Memphis, as she, with the aid of Mr. Williams, tossed a tubful of Girl Scout cookies into the water.

## Have You Seen? ...

● “Mulch Tillage in the Southeast,” by J. T. McAlister, Soil Conservation Service, USDA Leaflet 512. Minimum tillage—stirring the soil just as little as possible in producing a crop—is gaining momentum throughout the country. Mulch tillage is the southeastern Coastal Plains form of minimum tillage. This leaflet lists its benefits and soils suitable for and crops adapted to mulch planting, tells how to handle crop residues and to mulch plant, and gives production costs and yields.

● “Wild Turkeys on Southeastern Farms and Woodlands,” by Dale H. Arner and Verne E. Davison of the Soil Conservation Service, USDA’s Leaflet 526. The wild turkey is native to the Eastern and Southeastern States and is the origin of our domestic turkey. This 8-page leaflet tells how to manage land to provide these game birds with more food and water and with better cover and protection.

◆ Oregon State University research will center on ways to increase pasture acreage on some of the poorer soils now used for small grains and other surplus crops. Better pastures are needed to boost Oregon’s deficit livestock production.

◆ A North Dakota farmer reports that grass and legume rotation in his cropping systems has restored soil tilth, reduced erosion, increased his yields, and reduced his operating costs. The rotation was set so that every 3 years one-half of the grass and legume would be broken up and returned to cropping.





## Francis E. Coxe

South Carolina

# Conservation Man of the Year

**F**RANCIS E. Coxe of Marlboro County S.C., recognized as the founder of and first major contributor to the Soil Conservation Districts National Foundation, has a deep appreciation for history and a keen interest in the future.

Coxe is chairman of the board of supervisors of the Marlboro County Soil Conservation District, a former president of the South Carolina Soil Conservation District Supervisors Association, and for 4 years was chairman of the State Soil Conservation Committee. At its December 1963 meeting, the State association named him "Conservation Man of the Year."

He owns and operates a 2,000-acre farm near Bennettsville, S.C.

Nearby, his family still farms a 150-acre tract granted in 1765 by King George III to Emanuel Cox (without an "e"). Coxe lives in a big white frame house built by Moses Coxe, an ancestor, in 1832. Heavy locks, bearing the name of the famous English locksmith Carpenter and a royal seal, on six of the doors in the house are examples of many interesting and valuable antiques that can be seen about the Coxe home or the nearby log cabin that serves as a recreation center. There's even a waffle iron a great-great grandmother held over the flames from a massive fireplace.

Coxe said he plans to give some 100-year-old agricultural books to the Districts Foundation's recently

established library in League City. He urged that others consider making similar donations to the library, especially publications dealing with the history of soil and water conservation districts.

NACD President Marion Monk said of Coxe: "He's probably more responsible for there being a Foundation than anyone I know."

Coxe has been recognized as a "Tree Farmer" by the American Forest Products Industries since 1945. His farm includes about 1,000 acres of well-managed timber, mostly pines. He plants cotton, flue-cured tobacco, and soybeans and has improved pastures for his Hereford cattle.

This year, Coxe and several other farmers of the area participated in what he termed "an experiment." They each planted about 2 acres of flax in cooperation with a company from Holland that has built a factory at nearby Hartsville to make linen fiber. He said the company chose the Pee Dee area of South Carolina to produce flax because, among other reasons, its climate is similar to that of Holland where the company grows flax and manufactures linen on a larger scale.

Mainly because of his interest and accomplishments in promoting conservation and development of natural resources, thousands of boys and girls enjoyed recreational activities at three camps in Marlboro County this summer. He helped to get sites for and develop camps for the Pee Dee Council of Girl Scouts covering nine counties, for Presbyterian young people from seven counties and Baptist young people from two counties.





Coxe was born in 1895 in the same community where he, his wife, and two children now live. He received a B.S. degree in electrical engineering from North Carolina State College in 1917, did graduate work at Stevens Institute, and served as an ensign in the Navy. He was district manager of the Carolina Power and Light Company at Maxton, N.C., from 1926 to 1945. All along he maintained his farm in Marlboro County and when he retired from the electric company he returned to the home place to devote full time to conservation farming. He's an elder in the Blenheim Presbyterian Church, has served as chairman of the Board of Trustees of the former Presbyterian College at Maxton, and has been a Rotarian for 36 years.



**CONSERVATION — IN THE PEOPLE'S HANDS.** By AASA Commission on Conservation. 1964. American Association of School Administrators, Washington, D. C. 350 pp., illus. \$6.00.

The American Association of School Administrators Commission on Conservation can be proud of this new book that is the collective effort of many persons.

The book gives new scope and broadens the definition of conservation. It is not a reference volume of "how-to-do-it" conservation nor is it a text book for teachers. Rather it is a compilation of essays "addressed to everybody" to say that "conservation is everybody's business."

The early chapters put in perspective man's relationship with natural environment, changes in natural environment brought

about by man's use and development of resources, and a most significant listing of "feelings and beliefs" in the culture of the United States that "in the long run determine the manner in which natural resources are used."

It is made clear that conservation, as an attitude as well as action, finds its basic roots in an educated society. In America we did not wait until depleted farmlands caused us to go hungry or until all our forests and game were gone, before instituting nationwide programs of soil conservation or forest and wildlife conservation. The educational level of the public made it possible to comprehend the need and to start action ahead of actual disaster.

It is also made clear that although resource conservation education is imperative in a democracy, this will not in itself bring about needed changes. "Pleasant conversation and interesting speculation fall short of the mark when action is called for."

While the point is repeatedly well made that conservation progress "rests upon an intelligent, informed citizenry that is able and willing to carry responsibility," it also becomes clear that some of the citizenry must carry more of the responsibility than others — that "everybody's business" can become "nobody's business." Illustrations of conservation action by individuals, by cities, States, and the Federal Government also illustrate the fact that neither the dollar and cents costs nor the benefits fall alike on everyone.

The book ends on an optimistic appraisal of significant progress in reforestation and forest fire prevention, in good land use practices on private land, flood reduction, more game, more parks, more farm ponds, lakes, and outdoor recreation spaces. Instead of the usual condemnation of wanton destruction from man's avarice, the book closes with these significant

statements: "The people of this country have a wider range of choices in the use of natural resources than they have ever had . . . Working through democratic government, public institutions, and private enterprise they can use the resources of the country to build the kind of community and the kind of life they want." — GLADWIN E. YOUNG, *Associate Administrator*.

**LAND AND WATER FOR RECREATION.** By Marion Clawson. 144 pp. 1963. Rand McNally & Co., Chicago. \$2.25.

This paperbound book in Resources for the Future's Policy Background Series is a companion volume to *Land for Americans* by the same author reviewed in July *Soil Conservation*. It considers in detail a newly important land use that was the subject of one chapter in the more general study.

The current lively concern with outdoor recreation finds most agricultural and conservation workers eager for factual information and interpretation of the subject.

This book serves to summarize in understandable fashion most of the present knowledge in the field. It draws heavily on studies by Resources for the Future and on the voluminous reports of the Outdoor Recreation Resources Review Commission. To the average reader, the lucid interpretation is likely to be even more appreciated than the wealth of basic facts presented.

—B.O.

● **Soil and Water Conservation District Program, Northumberland County, Sunbury, Pennsylvania.** 1963. 60 pp., illus. An unusually complete description of the natural resources of the area, illustrated by photographs and colored maps. The booklet also summarizes district accomplishments of the past 20 years and outlines "a plan for progress for the next 30 to 40 years." A form for ordering at \$1 each is included.



From the Administrator:

## The New Technical Service Centers

ONE of the major organizational problems of the Soil Conservation Service since our seven regional offices were abolished in 1953 has been to provide technical services to State staffs from representatives of the Washington office located in widely scattered field offices.

Because our lines of communication have been too long, it has been difficult to coordinate our technical know-how in assisting the States. At the same time, it has been difficult to keep the technical specialists advised of program developments, policy changes, new procedures, and of problems facing the service.

Plans to correct this situation have been in the making for some time. The President's budget for 1965 and the accompanying personnel ceilings made it mandatory that we move now to make needed changes.

The plan finally approved is to consolidate our technical services to the States into four Regional Technical Service Centers, each under the supervision of a field representative. Consolidation will be completed by June 30, 1965.

The Regional Technical Service Centers will be located at Upper Darby, Pa., for the Northeast; at Fort Worth, Tex., for the South; at Lincoln, Nebr., for the Midwest; and at Portland, Oreg., for the West. The accompanying map shows the States that will be serviced through these centers.

The centers will consolidate Washington-Field offices that since 1954 have been at 12 locations.

In addition to the field representative at each Regional Technical Service Center (with the exceptions noted) will be each of the following:

Engineering and watershed planning unit, cartographic unit (except Upper Darby), field information unit, principal soil correlator, administrative officer (except Lincoln and Portland), and specialists in agronomy, biology, plant materials, range, woodland, and resource development.

The National Cartographic Laboratory at Hyattsville, Md., will continue to serve the Northeast. The Cartographic Unit at Spartanburg will continue to serve North and South Carolina, Georgia, Florida, Alabama, Tennessee,

Mississippi, and the Caribbean Area.

The field representative in charge of each Regional Technical Service Center will report directly to me. He will be a major member of my staff but not a line officer. As a staff supervisor his job will be to coordinate the various services provided to the States. He will not provide regional administration to the States served by the center. He will maintain his close working relationship with me by participating in Washington "office weeks" and other administrative conferences.

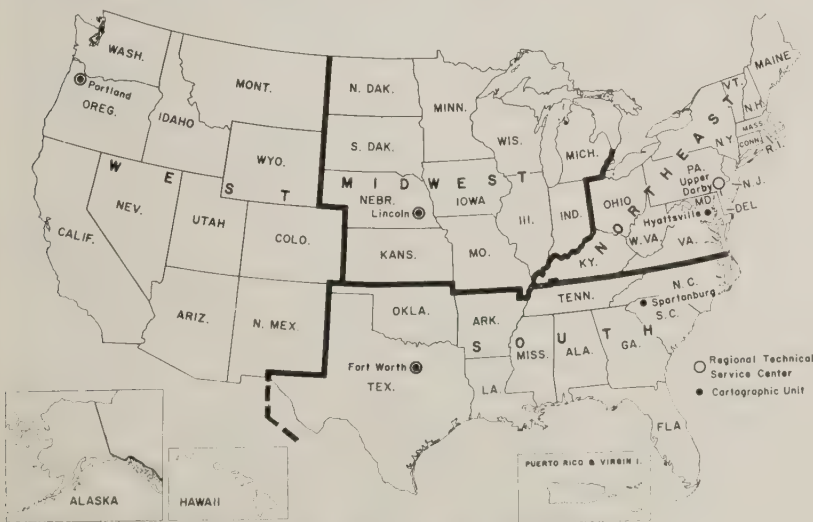
All personnel located at the four centers except the field representatives, their secretaries, and the center administrative units at Upper Darby and Fort Worth, will continue to be members of the staff of the division or other unit in the Washington office from which they receive guidance.

Since several months are being provided within which to complete this realignment, I'm sure all qualified employees can be placed in suitable positions within the organization if they are willing to transfer where the vacancies exist. This will avoid invoking reduction-in-force procedures.

We hope to put this new system into effect in stages during the year. The States will continue to be serviced by Washington-Field personnel from their present locations until further notice.

I feel confident that the new system, once we have "sweated out" the pangs of change, will make our organization more efficient and effective.

I am counting on all of you to help make these transitions in staffing and servicing as smoothly as possible. —D. A. WILLIAMS



Areas to be served by Technical Service Centers.



If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

## MULTIPURPOSE FARM POND

Story on page 19

Bill Jolley sees beauty as well as utility in his farm pond near Colville, Wash.

He built the pond primarily to assure a supply of water for fire protection. Soon after it was com-

pleted it was called into use to stop a woods fire nearby.

Now stocked with fish, it has also become a recreation spot for family and friends.





535

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

AUG 25 1964

CURRENT SERIAL RECORDS

SEPTEMBER 1964

VOL. XXX NO. 2

# Soil Conservation

MEETING THE URBAN CHALLENGE:

*Town Plans in Massachusetts*  
Page 27

*Schoolyard in New York*  
Page 39

*Highways in Missouri*  
Page 43





# Soil Conservation

## *Town and Country...*

We heard much favorable comment after State Conservationist Ben Isgur spoke a few weeks ago to the Washington SCS staff about the unique conservation setup in Massachusetts. We asked him to describe for the rest of us (p. 27) the recent trend-setting changes in legislation there that make conservation districts (no longer limited to soil and water) a central source of assistance to both urban and rural people on all phases of resource conservation. Our lead story is the result.

**Shock Reaction:** Perhaps an earthquake was not necessary to shake the proposed Kodiak Island Soil Conservation Subdistrict of Alaska into action, but it helped. This is one of the interesting things we learned from State Conservationist Oliver's response (p. 30) to our inquiry about the effects of the catastrophe of March 27 on agriculture and conservation. Alaska, too, has a unique system of soil conservation districts (p. 33). Farmers reacted immediately and SCS quickly went into action to help alleviate the effects of the disaster.

**Cover Picture:** Conservation plantings frame the terminal of Dulles International Airport. This night photo was made by the Federal Aviation Agency.



## CONTENTS

- 27 Unified Conservation Planning**  
Massachusetts brings town and country together  
*By Benjamin Isgur*
- 30 A Shock To Alaska Agriculture**  
Earthquake spurs landowners to form subdistrict  
*By William B. Oliver*
- 32 Golf Balls And Barbecue Replace Apricots**
- 33 Soil Conservation in Alaska**  
Subdistricts bring SCS technical aid to "The Great Land"  
*By Michael D. Hill*
- 36 Airport Conservation Makes Good Neighbor**  
At Dulles International
- 39 Solving Playground Problems Part of District Program**  
*By George S. Brown*
- 41 SCS Helps Repair Land Damaged by Montana Flood**  
*By P. E. Farnes*
- 43 State Highway Construction and Soil and Water Conservation**  
*By M. J. Snider*
- 46 Review**  
Conserving American Resources; New Publications
- 47 From the Administrator**  
SCS Services to Urban Areas

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.  
BEN O. OSBORN  
Editor

GEORGIE A. KELLER  
Editorial Assistant

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Prints of photos can be obtained on request.

**Subscriptions:** Price \$1.50 per year, \$2.25 foreign. Single copy, 15 cents. A discount of 25 percent will be allowed on orders of 100 or more sent to the same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.



# Unified Conservation Planning

Massachusetts brings town and country together  
in agencies for all resource conservation

By Benjamin Isgur

*State Conservationist, Amherst, Mass.*

**N**EW legislation in Massachusetts unifying all resource conservation efforts under the direction of a single State agency is bringing rural and urban people together as never before in meeting the growing problems of urbanization.

The State's unique conservation setup makes soil conservation districts—now called simply “conservation districts”—responsible for providing “one stop” technical service in all phases of resource conservation and land use planning.

## Conservation Commission

In addition to conservation districts, cities and towns have their own “conservation commissions” responsible for taking the leadership in urban conservation programs. The commissions recommend conservation measures to be included by town planning boards in “master plans” for land use. They obtain technical services, such as soil surveys and interpretations, from the districts.

In Massachusetts, “towns” include rural as well as urban areas and are generally equivalent to townships in many other States. To date more than 200 town conservation commissions have been established within the 15 reorgan-

ized conservation districts that cover the entire State.

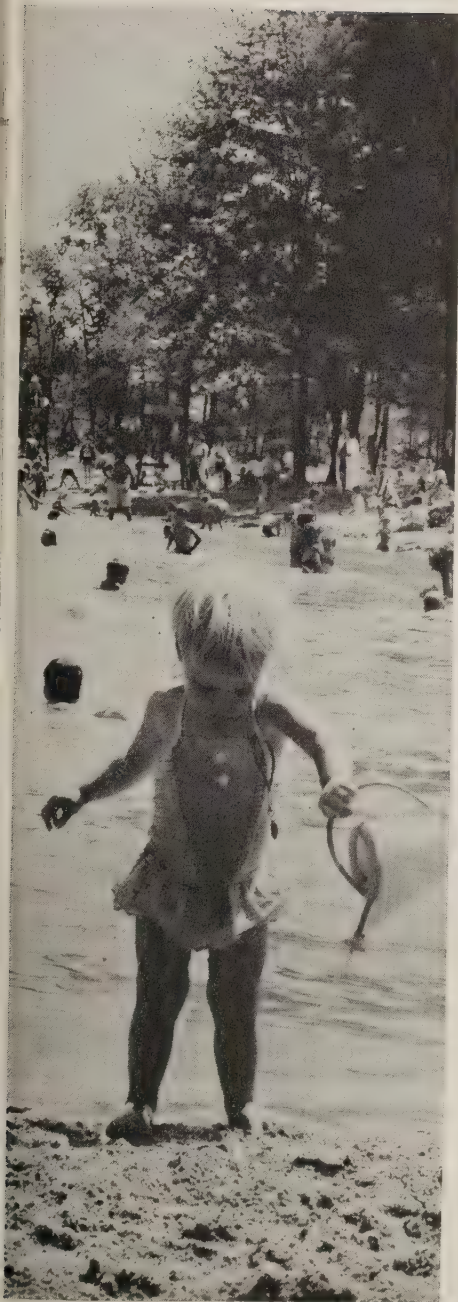
Both the districts and commissions are under the administration of the State Department of Natural Resources. A new Conservation Services Division in the department channels technical assistance to the districts and commissions.

The resulting organization of resource agencies in the State assures that every new school, park, shopping center, housing subdivision—in short every conceivable community facility—may have the entire range of conservation thinking and skills applied directly to its location, development, and protection.

## District Experience

The salvage of valuable New England farmland and the designation of conservation areas dedicated to wildlife, nature trails, and open space in urban areas are also encouraged, as evidenced by scores of requests for technical assistance already received from expanding towns and villages.

Because citizens had become concerned over the increasing loss of natural resources to mushrooming housing developments, industrial sites, and the like, the Massachusetts General Court in 1957 passed the Town Conservation Commissions Act enabling cities and towns to set up “Conservation Commissions” as functional units of com-



The pond is part of a recreation area developed by the Town of Medfield, a cooperator with the Norfolk Conservation District.





SCS Soil Scientist Charles Upham finds wet soils and high water table a common problem in the Town of Hanover. The resource inventory points out possibility of wetland conservation and management for such areas.

munity government.

These commissions are empowered to operate municipal conservation programs and to perpetuate adequate open space. They have funds to purchase land and acquire easements. For the first time, direct lines of communication were opened between all the community governing bodies and the complete range of State, Federal, and local agencies ministering to conservation needs of both rural and urban land.

### A Broadened Role

Meantime soil conservation districts had gained considerable experience in answering requests for advice on urban conservation problems. In the past two decades many a hard-pressed town selectman, mayor, or city manager had found the district supervisors and the technical people of the Soil Con-

servation Service a prime source of aid in coping with perplexing soil and water problems or in making land use and zoning decisions. Supervisors and soil conservationists however had grown increasingly frustrated with what was obviously a piecemeal mode of giving aid to communities.

The General Court in August 1963 amended the Soil Conservation Districts Act to broaden the role of soil and water conservation districts. It dropped the words "soil and water" from the names of the districts and placed them under the supervision of the State Department of Natural Resources already encompassing all other resource agencies within the State.

The former State Soil Conservation Committee became the "State Committee for the Conservation of Soil, Water, and Related Resources" and was enlarged to in-

clude the Commissioner of Agriculture, the chairman of the Water Resources Commission (who is also the Commissioner of Natural Resources) and the dean of the College of Agriculture. The new State Committee also includes a representative from the Massachusetts Association of Conservation Districts, the Massachusetts Association of Town Conservation Commissions, the Massachusetts State Grange, and the Massachusetts Farm Bureau. The SCS State conservationist is an advisory member.

In the language of the act, the responsibilities of conservation districts were amended to include . . . "ocean, shellfish, and inland fisheries; wild birds, including song and insectivorous birds; wild mammals and game; sea and fresh water fish of every description; forests and all uncultivated flora together with public shade and ornamental trees and shrubs; land, soil, and soil resources, lakes, ponds, streams, coastal, underground, and surface waters; mineral and natural deposits."

In effect, the General Court gave conservation districts *carte-blanc* to become "one stop" headquarters for resource-guiding assistance.

### Technical Services

To insure that the many specialists required for such a broad program would be readily available, the new legislation established a Division of Conservation Services in the State Department of Natural Resources. The unit serves both as a clearing house and as a communications traffic manager for requests for technical information and services. The mechanism operates to assure that resource specialist teams drawn from one or several agencies are alerted to opportunities to be of service to local jurisdictions on natural resource problems.

Conservation districts understand the advantages of the re-



source team approach in community conservation planning. Although little time has elapsed since the legislation was passed, several districts have acted to use their new authorities in carrying greater assistance to towns and cities undergoing the growth-pains of expansion.

One of the pioneering efforts at complete conservation planning took the form of direct action in 1961 at the Town of Hanover, a quaint, former shipbuilding community on the route from Boston to Cape Cod.

Worried about future growth and wanting to preserve the rural values that had attracted many of its residents, citizens of the town wanted to preserve open spaces, both for recreation and for conservation reasons. The town planning body readily grasped the opportunity offered by the supervisors

of the Plymouth Conservation District to evaluate the community's soil and water potentials for natural resource development. The resulting pilot project paved the way for a significant alliance between planning consultants, the Town Conservation Commission, and SCS soil scientists.

### The Hanover Report

Already well along with a survey of the entire county, the SCS extended soils mapping to complete a detailed investigation of Hanover's entire area of 10,000 acres. Further, the soils men provided interpretive information indicating suitability and limitations of each acre for the full gamut of town needs, including septic tank disposal areas, homesites, athletic fields, wetland for wildlife, sources of sand and gravel, roads, woodland agriculture, and surface run-

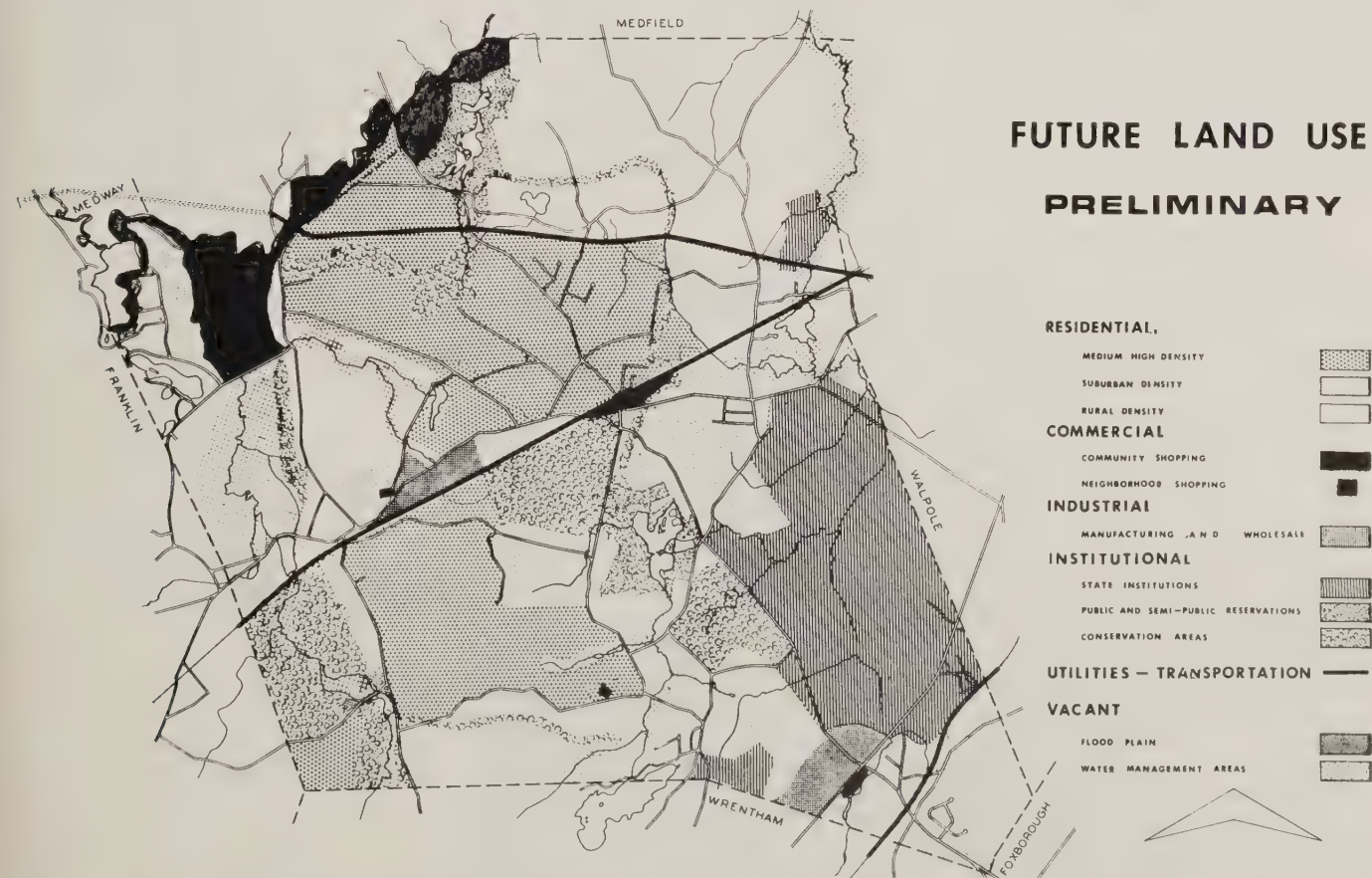
off disposal.

In accepting the conservation district's contribution toward preparation of Hanover's Master Plan, professional consultants cited the scientific "authority" of the SCS data. Soils maps and interpretations were recognized as excellent guides for decisions about road layouts, drainage, subdivision regulations, and building codes.

Published in two volumes by the Massachusetts Department of Commerce and distributed widely by the U. S. Department of Agriculture the "Hanover Report" drew attention from civic and resource agency officials throughout the United States and in several foreign countries. Inquiries from conservationists and planning interests for supplementary information were numerous.

Many Massachusetts town and

*(Continued on p. 45.)*



Portion of Future Land Use Map for the Town of Norfolk, Mass., prepared by Charles E. Downe, planning consultant, using soil survey information and resource inventory maps supplied by SCS and Massachusetts Department of Natural Resources.



# A Shock to Alaska Agriculture

## Earthquake damage spurs landowners to form conservation subdistrict

By William B. Oliver

*State Conservationist, Palmer, Alaska*

**T**HE earthquake of last March 27 struck Alaska's limited agriculture a cruel blow, but farmers, ranchers, and agricultural agencies promptly joined efforts to repair the damage.

Ranchers on Kodiak Island, who had been considering forming a soil conservation subdistrict, were spurred to complete the action, and the Soil Conservation Service immediately made special funds available to assist them. Other USDA agencies also provided special aid to this, the most severely damaged agricultural area.

Although the agricultural enterprise of Alaska ranks rather small in the total economy of the State, it is all-important to the farmers and ranchers struggling to develop sound and profitable individual

operations. Little has been said or written about the earthquake's effect on agriculture, although the story of destruction to cities and towns has been told and retold.

### Kodiak Damaged

Of the agricultural areas, Kodiak Island and its adjacent islands suffered the most property and land damage. The area was extremely hard hit by the great tidal waves that battered the east shores.

Because it was early spring, most of the cattle were grazing on the beaches or in adjacent low areas. About 175 animals were drowned or washed out to sea. Three ranch houses, 1 slaughter house, and 20 or 25 sheds, barns, tool houses, and other property were swept away, along with feed grain, silage, and baled hay. About 25 miles of corral and range fence

were lost. Several hundred acres of land used for hay production was left covered with all kinds of debris and rubbish.

To add to the difficulty, Kodiak Island sank from 5 to 8 feet. As a result, beach rye areas formerly used as winter range are now covered by normal tides and ranchers were unable to produce their normal supply of winter feed. Part of the road leading from the City of Kodiak to the outlying ranches was completely destroyed, and several miles of road not destroyed is now under water twice a day at high tide.

The problems created by the earthquake quickened interest of ranchers in the effort to form a soil conservation subdistrict to obtain assistance available from Federal agencies. A meeting of local people in the City of Kodiak on May 16 voted favorably on the proposal and elected a board of supervisors. Representatives of the Agricultural Stabilization and Conservation Service, Farmers Home Administration, Federal Extension Service, Soil Conservation Service, and the Bureau of Land Management explained what help their agencies could provide in the emergency. The Small Business Administration and the American Red Cross also were represented at the meeting.

### Special Aid Funds

Immediately upon formation of the subdistrict, the SCS made special funds available for reconditioning and transporting a bulldozer obtained from military surplus. It was granted to the subdistrict to assist in clearing tidal wave-borne debris and in clearing



Emergency stock feed airlift to stricken areas was organized by dealers, Civil Defense, and USDA Defense Board.



and conditioning new land to replace that lost or damaged by the earthquake.

The ASCS Committee set up emergency cost-sharing practices for debris removal, fence building, and reseeding of hay and range areas. Farmers Home Administration made available low-interest emergency loans for replacing ranch buildings, rebuilding homes, and rehabilitation of hay and grazing lands.

In addition to Kodiak and adjacent islands and a few of the Aleutian Islands, Alaska's agriculture is confined largely to three general areas: The Tanana Valley between the Alaska Range on the south and the Yukon River on the north, the Matanuska-Susitna Valley in south central Alaska, and the Kenai Peninsula.

These areas had little actual property or land damage. The Tanana Valley, farthest away from the shock center, suffered the least. Wells in the Matanuska and Susitna areas were muddied and a few went partly dry. Some fields were cracked, and a few small landslides occurred in the area. On the Kenai Peninsula, in the area near Kachemak Bay, some areas of poorly drained sloping land slipped, and a number of sizable crevasses opened up where land settling occurred.

### Transportation Crucial

The real emergency in these areas was due to the breakdown in transportation. At Seward and Valdez the railroad terminal and steamship docks were completely destroyed. Road bridges on the highway from Anchorage to Seward and on to Kenai had collapsed or were badly damaged. The Glenn Highway from Anchorage to Palmer was blocked by snow and rock slides. Communications were cut off within the area. Electric lines and part of the generating equipment were out of commission. Many miles of the Alaska



Damage to agricultural land, as with this area of Belgua silt loam near Homer, is a little publicized effect of the earthquake.

Railroad tracks were twisted and warped out of shape.

Before the earthquake, most of the dairy farmers had been short of roughage and grain and had supplies ordered to arrive by boat and rail shipment. The Tanana Valley and Kenai Peninsula were especially hard hit by the shortage. The Matanuska Valley area had an adequate supply of feed and fodder and shared it with the other areas as soon as transportation was available. Luckily for the Tanana Valley, the tracks from Anchorage north were temporarily repaired within weeks so feed could go to that area by rail. Feed for the stock on the Kenai Peninsula had to be flown in by the Air National Guard for 10 weeks.

Emergency feed grain programs

for the Tanana Valley, the Kenai Peninsula, and Kodiak Island areas were approved by USDA to provide dairy feed in the Tanana area until harvest of fall grain crops and to supply winter feed for beef cattle on the Kenai Peninsula and Kodiak Island.

The Department of Agriculture, State, and County Defense Boards got a great deal of practical experience in assisting the Civil Defense organization during a real emergency for the 6 weeks following the earthquake. A few deficiencies showed up in the system, but generally things moved along efficiently. The experience showed that if we ever have to put emergency operations to the test again, USDA can be depended on to measure up to the challenge.



# Golf Balls and Barbecue Replace Apricots

**G**OLF balls are dropping these days in a former 20-acre apricot orchard at Cupertino, northwest of San Jose in Santa Clara County, Calif.

It's a kind of a switch from what's happening in the orchards down south, where, 'tis said, they cross contractors with orange trees to get houses. Here, an orchardist and a plumber, Sigfrid and Albert Nelson, came up with a nine-hole golf course.

And it's proof that not all former agricultural land has to proliferate with subdivision houses.

"You just couldn't support this land with apricots any more—taxes are too high, and there's too much value for other things. But it just didn't seem right to break this up into city lots," said Sigfrid Nelson.

Having worked with the Soil

Conservation Service on another orchard property, the Nelsons contacted the local soil conservation district office for SCS engineering assistance in the land use conversion. The SCS provided basic topographic data for use in the layout of the recreation development.

Blackberry Farm figured in family outings of the area nearly 100 years ago. It got its name from the 5-acre blackberry patch, which has since disappeared, developed, along with vineyard and orchard, in the tight little valley along Stevens Creek, by a man named McCaulay.

Before McCaulay, there was, briefly, McClellan. And before that Captain Elisha Stevens, a pioneer for whom the creek was named.

Stevens had a secluded, shaded retreat along the creek amidst towering sycamores and oaks—until neighbors started hemming him in

a couple of miles away. He sold out and moved. McCaulay in the late 1860's or early 1870's, local historians say, developed the spot into a summer resort—a favorite picnic spot for folks of the area.

The history is obscure until the early 1950's when the Nelson brothers acquired the property and later converted some of their land into a golf course. Soon Sigfrid Nelson's daughter and son-in-law, Mr. and Mrs. Jack Plata, and Albert's son and daughter-in-law, Mr. and Mrs. Eric Nelson, discovered the possibilities of developing a recreation area in the peaceful but brush-filled grove along the creek on the farm.

Brush clearing and building picnic facilities—barbecues, gas stoves, sinks, tables, benches—proceeded year by year. A couple of swimming pools add to the enjoyment.

Today, on a summer evening or weekend, thousands of men, women, and children make the grove ring with the sound of happy picnicking. A number of companies and fraternal and social groups reserve the place for their traditional annual outings.

The diversion dam on Stevens Creek, which once supplied water for the apricot orchard, now provides water for the large and small ponds, the water wheel, and the tiny little stream that meanders through the heart of the golf course—and provides the usual hazard to duffers.

It has become traditional for Americans to clamor for Government to do something about preserving historical and recreational sites. At Blackberry Farm, private enterprise is doing the job.

It could well be the only golf course in the country where you can nibble on an apricot—in season—while waiting your turn to play the next hole.—ROBERT F. TEGNER, *Field Information Specialist, SCS, Berkeley, Calif.*



Sigfrid Nelson stands beside a stone barbecue pit with swing-away grill, a homemade product, at the Blackberry Farm picnic grove.



# Soil Conservation in Alaska

**Subdistricts bring SCS technical aid to small farming areas of "The Great Land"**

**By Michael D. Hill**

*Soil Conservationist, SCS, College, Alaska*

**T**HE land called Alaska—rich in resources, vast in area, unique in reality, colorful in history—conjures scenes of endless ice and snow, fur-clad Eskimos with dog teams streaking across the frozen tundra, great herds of unmolested wildlife, and sparkling northern lights dancing against the blackness of the long arctic night.

"Last Frontier," "Land of the Midnight Sun," and "Seward's Folly" may come to mind. Facts and statistics explode many of these false impressions. For Alaska is a land of contrasts and extremes.

Many things make Alaska exceptional—homesteading and agriculture among the important. A Kansas wheat farmer may worry about his acreage allotment, a California cattleman the price of

beef in the Chicago market. The Alaskan pioneer is concerned about clearing another 10 acres of wilderness or buying a much needed plow. The 49th State has only about 400 farms comprising roughly 80,000 acres. But the farmers are determined and devoted to successful farming. Problems and challenges facing the 20th century Alaskan homesteader and farmer are seemingly staggering. More have failed than have succeeded. High costs, limited markets, and insufficient capital claimed many.

One common bond links the Alaskan homesteader and farmer with his southern likeness—a sincere respect and love for the land expressed through the activities of local soil conservation districts.

North of the massive Alaska Range, 150 miles south of the famed Arctic Circle, is Fairbanks,



SCS provided seed of smooth sudan-grass and red clover for forage trial in the Fairbanks subdistrict.

second largest city and the major commercial center of interior and northern Alaska. The surrounding Tanana Valley is the northernmost agricultural area in America. Essential to the valley's farming endeavors are the Fairbanks and Salcha-Big Delta soil conservation subdistricts.

## **One Statewide District**

Alaska differs from other States in having just one organized soil conservation district administered by the Alaska Department of Natural Resources. By law, this district includes the entire State; all local subdivisions are "subdistricts." As might be expected, programs of these subdistricts are distinctly different from those of other regions.

Alaska is not the coldest place on earth, as many believe. However, the Tanana Valley is noted for extreme seasonal temperatures,



Jute matting lines a roadside ditch in a cooperative erosion control trial.



and its mean annual temperature is 26 degrees. A sizzling 99 degrees once was recorded just north of Fairbanks. Record low is a chilly 66 degrees below zero—that's 98 degrees below freezing!

Normally the valley receives about 12 inches of water a year, with snowfall averaging 55 inches in Fairbanks and usually remaining on the ground from mid-October to mid-April. Because of the scant moisture, there are no glaciers in interior Alaska, a fact tourists find difficult to believe.

Crops grown in the Tanana Valley include oats, barley, grass forages, and a wide assortment of row crops. A few legumes are adaptable, but seed supply is scarce. Dairying and potato growing are the main farming operations, with cabbages, carrots, and lettuce also being produced commercially.

The growing season is short—102 days—but the many hours of sunshine cause phenomenal growth in crops. From May through September, the total hours of light is

nearly equal to 8 months at the equator. A day's work on the farm in the interior may literally end at midnight.

Soils of the Tanana Valley are alluvial, deposited by water, and upland or loess, deposited by wind. With adequate fertilizer, the soils produce good yields. Fairbanks subdistrict has more than 75,000 acres of class II land.

### Permafrost a Problem

Permanently frozen subsoil—permafrost—is common throughout the valley—a source of amazement to the nonresident. Depth and thickness of the permafrost depend upon the vegetation, which acts as an insulation layer. Permafrost usually has ice in its veins, giving it a rock-like hardness. Removal of the vegetation often causes the ice to turn to water, the soil to mud, and life on a homestead a mess! In most cases, the problem is only temporary; as the permafrost recedes, so often does the melt water, particularly on well drained soils.

Supervisors of local subdistricts—whose personal experience plus foresightedness play a vital role in planning and directing a conservation program in a new land—represent a wide cross section of backgrounds: Farmer, big game guide, heavy equipment mechanic, teacher, and trapper.

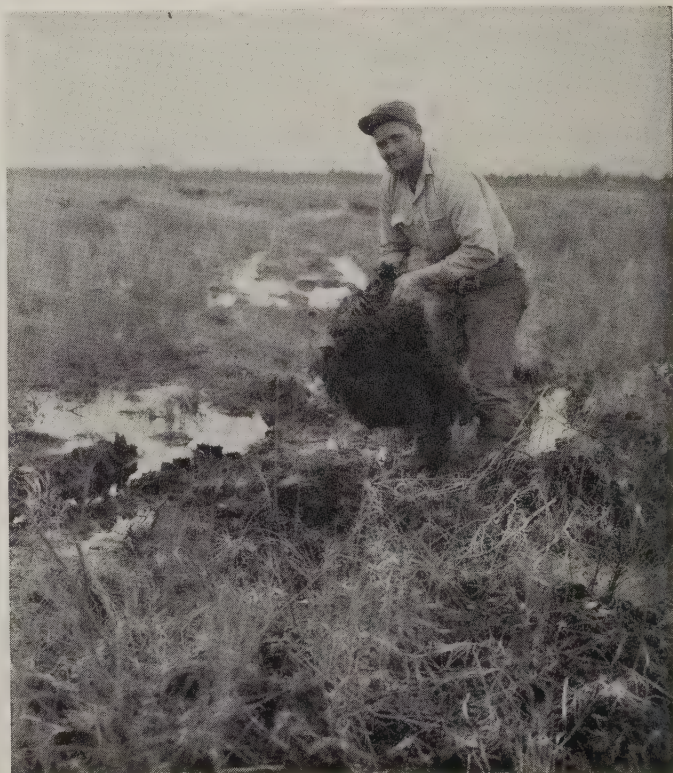
Subdistricts provide technical assistance and information to more than 200 subdistrict cooperators and hundreds of other landowners through a Memorandum of Understanding between the subdistricts and the Soil Conservation Service. Assistance is given to newcomers searching for land to settle. Guiding settlement is important in insuring proper land use.

### Soil Surveys in Demand

Greatest demand is for detailed soil survey maps which blanket over half a million acres in the Tanana Valley. Used for the homestead development plans—especially land clearing—map data help avoid costly mistakes. Non-agricultural use of soils maps has



Back steps of a residence in College, Alaska, show effects of melting of permafrost in a 3-year period.



A thick layer of moss on soil surface provides insulation against melting of permafrost until land is broken.



increased rapidly—by State and Federal land offices, tax assessors, real estate offices, and road departments.

As elsewhere, the framework for soil and water conservation practices is the farm plan. Group facility projects also have been encouraged. Two planned to date: A drainage proposal in the Fairbanks subdistrict entailing about 10,000 acres and an 8,000-acre flood control and windbreak job in the Salcha-Big Delta subdistrict.

The most widely applied practice in both subdistricts is land clearing. Large bulldozers are used during the winter months to remove heavy vegetation without disturbing the frozen topsoil. The cleared material is placed in windrows and burned at a later date. Soil conservationists work closely with landowners, selecting areas to be cleared and prescribing proper methods to use. Only land suited to the production of crops planned by the landowner is cleared. Costs range from \$35 to \$80 an acre and in a few extreme cases \$100 an acre.

Where potatoes are the main crop, contour farming and other soil-saving practices are widely used by farmers tilling highly erodible silty soils. Crop rotation is a necessity, but shortage of cleared land hampers its use by most farmers. Soil fertility is maintained by the use of crop residues, fertilizer, and some green manures. Permanent grass seedings are important for the small but expanding dairy economy and as a much-needed soil conservation practice. Most commonly used grass is Manchac smooth brome grass harvested for both hay and silage.

### Wind Erosion Too

In the southeastern part of the Salcha-Big Delta subdistrict, wind erosion is the major problem. Besides using permanent cover, stubble, and rough tillage, farmers have established many windbreaks

With SCS technical assistance,



Land clearing is one of the biggest problems facing farmers in the new agricultural areas of Alaska.

subdistrict cooperators in the area developed an overall windbreak plan. Strips of native trees are left intact at intervals during land clearing. Conservation thus unfolds on the land as residents work with what Nature provided.

Drainage problems are fairly widespread in the Tanana Valley, especially in the Fairbanks subdistrict. Hastening the thawing of permafrost by plowing often eliminates the problem as the excess water is able to percolate into the soil. However, ditches are sometimes required—no simple task when the land is too wet to support equipment. Dynamite to blast shallow ditches appears to be the long sought answer. Diversion ditches and grassed waterways are commonly used to intercept runoff and prevent serious erosion.

Both subdistricts fulfill a big need throughout the valley—an effective equipment rental program. Bulldozers, seeders, and plows help landowners apply conservation practices and allow subdistricts to carry out other conservation programs.

### Newsletter Helps

Information and educational activities play a big role in both subdistricts. The two issue a joint bimonthly newsletter, *Conservation Corner*, which reaches over 350

persons with items of interest about programs, conservation ideas, farming tips, and news briefs. The letter forges a good link between supervisors and landowners, in an area where communications are somewhat inadequate. Twice during the past 3 years the newsletter has been awarded second place in Area VII of the NACD's national newsletter contest.

Youth of the area are not forgotten. Salcha-Big Delta subdistrict sponsors an annual 4-H conservation tour and contest. Winners get an all-expense trip to the annual 4-H camp. Several ribbons have been won by subdistricts for booth displays at the annual Tanana Valley Fair.

Interior Alaska subdistrict programs may not appear different, certainly not as big as those on the "outside." Yet there is a big difference. Far removed from other States, unmatched elsewhere in the Nation, men and women voluntarily engaged in soil and water conservation present a striking distinction: The job is tough and painstakingly slow. Agriculture is still a struggling infant.

As one bewhiskered sourdough summed it up: "Soil conservation is mighty important to this country; even the Indians knew that—after all, they named it 'Alaska' which means 'The Great Land'."



At Dulles International . . .

## Airport Conservation Makes Good Neighbor

**"C**ONSERVATION has helped give the Nation's capital a picture-window looking squarely into the age of cosmic travel."

Words to this effect are uttered by resources-minded visitors to vast, new Dulles International Airport. They observe skilled management of soil and water on a unique area of 10,000 acres lying athwart two counties. Greeting them is the phenomenon of the world's first and largest nonmilitary jetport.

More astonishing is the port's harmonious blending with the hills, streams, woodland, wildlife—and increasing suburbia — of scenic

northern Virginia.

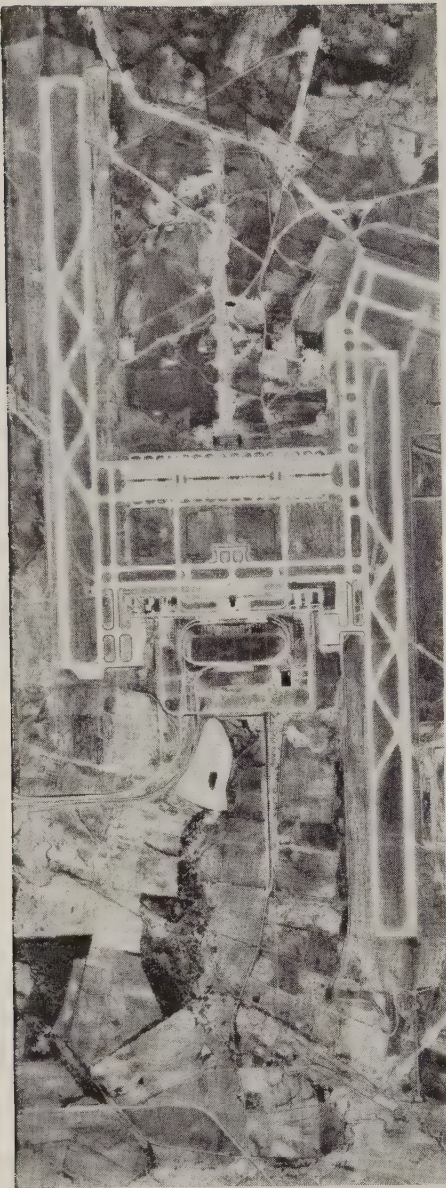
Dulles' builders were concerned primarily with the new era of supersonic transportation. This is evident in the 2-mile-long runways; more miles of high-speed taxiways; huge jetliner parking aprons; a towering, glass-walled terminal served by mobile passenger lounges; and a sprawling complex of navigational repair, maintenance, and traveler facilities. All the potentials for noise and confusion plus disruption of the neighborhood were at hand.

### Advance Planning

Yet, today, the communities in nearby towns such as Chantilly regard the airport as a "good citizen." Visitors are informed that Dulles affords resource protection and improvements that actually make for happier, safer living in the surrounding countryside. For instance, it has helped to abate flood dangers that existed long before the skyport appeared on aeronautical drawing boards.

High-altitude vertical photo shows landscape pattern of Dulles Airport. Lake near center catches drainage from terminal and parking lot. Third runway angles off photo to right.

Neighbors were spared nuisance of Dulles' enormous construction activity by temporary vegetation that checked runoff and dust, basins that stopped silt from reaching local streams (Federal Aviation Agency photo).





Victories in conservation at the airfield were aided by local leadership teamed with a score of specialized county, State, and Federal agencies. Initial sparks were struck by supervisors of the Northern Virginia Soil Conservation District. They contacted heads of the Federal Aviation Agency in charge of the development. The district sought an evaluation of Dulles' impact on their efforts to guide scientific land use planning in Fairfax and Loudoun counties.

District board members had good reason to inquire. The population

**Two million pine seedlings form border to screen the activity and muffle sound of jetport traffic. Glenn Anderson, SCS soil conservationist, and Gilbert J. Tobin, horticulturist for Dulles Airport, check their growth.**



explosion in suburban Washington had struck them full force. A tide of new homes, shopping centers, industries, roads, and other pertinent facilities threatened to engulf them. Pressure on local land-

scapes could be equated to the need for a brand-new, 24-room school every month. The Soil Conservation Service conservationists and soil scientists were figuratively be-seiged by developers and squad-

**Mowing is a big maintenance operation on the hundreds of acres of grass-covered grounds at Dulles (Federal Aviation Agency photo).**





rons of bulldozers. Unguided assaults on the land brought a mounting toll in damage from silt, excessive runoff, and floods.

FAA officials welcomed the soil conservation district's experience in heading off problems the giant port might otherwise create.

### Soils a Guide

Ultimately, Dulles' builders accepted a soil and water conservation plan. Except for its grand scale, it was not unlike coordinated operations pursued by millions of farmers and ranchers throughout the Nation's soil conservation districts. Methods of land treatment and uses were based squarely upon soils information furnished by the SCS.

Additional phases of resource-operations were guided by local experts in community planning, health, economics, recreation, parks, and forestry.

Throughout the 4-year period from ground-breaking to opening day ceremonies, contractors relied upon a system of cover crops to reduce the hazards of mud and dust. Temporary de-silting basins, urged



Two airport workers spread mulch in a planting of azaleas near the terminal buildings.

by the SCS, guarded offsite streams from pollution. Topsoil was stockpiled to speed the eventual revegetation of bald areas.

### Watershed Protected

An airport watershed project was modeled after the flood-relieving program familiar to hundreds of upstream areas across the United States. Dulles' watershed con-

trol work started with a concern for accelerated drainage problems bound to result from 1,000 acres of impervious pavement and roofing. Designs were later amplified to embrace the entire 15,000 acres of Horse Pen Run watershed. The project now controls runoff from much of the airport before the water reaches Broad Run on its way to the Potomac River, 25 miles above Washington.

Therefore, 60,000 residents along Broad Run's banks are safeguarded, for the first time in history, from storms of 100-year magnitude.

An outstanding attraction among Dulles' conservation features is Horse Pen Run's single flood-retarding structure. Its earthen dike rises 50 feet above the channel, to an elevation 270 feet above sea level. The 2-stage riser-outlet governs a permanent pool having 35 surface acres. This affords 32 million gallons of water storage for fire protection and recreational purposes. An ideal site for the basin allows the structure to hold back more than 15 inches of runoff before topping. At flood crest, the pool would increase to 500 surface acres.

The dam's unusual breadth accommodates a macadam, peripheral



Now part of the landscaping near the terminal buildings, this 10-acre lake served as a desilting basin during construction.



road graded to specifications of the Virginia Highway Department. The road crosses the 200-foot wide spillway on the contour safely below the control point. Thus the dike serves as a relatively inexpensive bridge. As such, it requires no unusual costs for maintenance or management. Forty feet beneath the spillway, the airport's main sewerline lies buried—an initial step in building the dam.

### Two Million Trees

Hardy turf, shrubs, and other useful and ornamental vegetation have stabilized the soil for tomorrow's demands. A 1,000-foot-wide buffer belt of forest will muffle the sound of the airport traffic. Two million tree seedlings have already been planted on 1,500 acres.

If another example of Dulles' conservation were needed, it can be found in the soaring, futuristic terminal building designed by the well-known Finnish architect, Eero Saarinen. Capping the outward-leaning walls of sheer glass is a roof shaped much like a mammoth bathtub. As a matter of fact, it serves as a catch basin—draining off rainwater that supplies a nearby, decorative fish pond.

Airport officials confirm that resource programing will continue to parallel the refinement of facilities that already take care of flight traffic from the ends of the earth. They say the process of growth at the \$100-million-plus establishment will very likely go on for at least 25 years. "By that time," they predict, "we may be handling rocket-ships."

Other more grandiose jet- and rocket-ports may be built as the space age unfolds. But Dulles, according to records of resource managers in northern Virginia, can hold rightful claims as the first of its kind to embrace conservation from the beginning on into the limitless future.—BERNHARD A. ROTH, *Field Information Specialist, SCS, Upper Darby, Pa.*

# Solving Playground Problems Part of District Program

By George S. Brown

*Work Unit Conservationist, SCS, Malone, N.Y.*

**S**OLVING the playground problems of the Central School helped the Chateaugay, N.Y., people realize that the district conservation program is for the assistance of all landowners, not farmers alone.

The school was bothered by two problems on its new playground.

The grounds stayed wet late in the spring and after every hard rain. Children got wet feet, tracked in mud on the school's new floors, and made a mess of the struggling lawn.

The other problem was a wide hedgerow interlaced with rusty barbed wire and other hazards such as broken bottles and sharp stones. The school board was worried about this condition, especially after a call from one of the mothers that her boy had been scratched by the wire.

The school principal, Maynard Pilling, asked the Franklin County Soil and Water Conservation

District for help. SCS soil conservationists suggested a conservation plan. It included 300 feet of diversion to intercept surface water and carry it safely away from the playground. It had a 700-foot outlet.

The hedgerow was first cleaned out, the valuable trees kept, and low spots on the school grounds filled.

Armand Trombly, who owns the farm adjoining the school property, needed an outlet for an open drain. So he and the school board agreed to make the conservation job a joint project. The outlet was constructed on Trombly's side of the boundary and the diversion on the school property.

As a result of "horse trading," Trombly paid the district for the contractor's equipment to build the outlet and the school paid for the hedgerow removal and the diversion. Rains just after construction proved the value of the diversion. Despite rain, the schoolyard stayed



A waterway constructed on the adjoining farm and now sodded provides outlet for diversion that protects school property.



in good condition. Both the farmer and the school board were pleased with the results.

A 1,500-foot line of 4-inch tile is planned to give the best possible drainage. Schools have budget problems too, Principal Pilling pointed out. So the tile will have to wait a while.

The Chateaugay Central School has 20 acres of red pine planted by the district in 1961. Several thousand shrubs for wildlife food and cover were also furnished by the district and planted by school children.

## Joint Committee Reviews Plans on Watershed Wildlife

Improved procedures at field level for coordinating fish and wildlife conservation aspects of small watershed projects are resulting from the recent establishment of a joint committee of Soil Conservation Service and Fish and Wildlife Service representatives.

In Georgia representatives of

the two agencies met to discuss questions raised by the Fish and Wildlife Service review of plans for the South Fork of Little River watershed. They resolved immediate questions and agreed on mutually satisfactory procedures for future projects.

The national committee is concerned mainly with implementation of policies and procedures for handling fish and wildlife opportunities and problems associated with the watershed projects. It formally considers only those individual projects with problems that cannot be solved at the local level by field representatives of the two agencies.

Members of the Committee from the Fish and Wildlife Service are James T. McBroom, assistant director, Technical Services; William M. White, chief, Division of River Basin Studies; and F. S. Henika, chief, Special Studies Section, Division of River Basin Studies; and from the Soil Conservation Service, Hollis R. Williams, deputy administrator for Watersheds; John H. Wetzel, director, Watershed Planning Division; and Lawrence V. Compton, head biologist, Plant Technology Division.

## SCS PHOTOS GREET VISITORS AT DULLES



A selection of the best photos from SCS's "America the Beautiful" and "Water for America" series greets arrivals to Dulles International Airport.

Many foreign visitors now enter the United States through this terminal, and the pictures give them a quick introduction to the geography, the resources, and the conservation activities of the Nation. They have a permanent location in the spacious concourse whose glass

walls add airiness to the building.

The exhibit has created considerable interest among the visiting and local VIPs as shown by the calls and letters received by the Washington SCS office — such as those from a Texas business man, the Japanese Embassy, the mayor of a city in western Washington, head of a fertilizer institute, a railroad in the midwest, and a chemical company in California.

## NEW FACILITIES FOR CONSERVATION RESEARCH

Expanded facilities for soil and water research are being established by the Agricultural Research Service at four locations in the United States.

The Snake River Conservation Field Station at Twin Falls, Idaho, and a new laboratory at the Palouse Conservation Field Station, at Pullman, Wash., are in operation.

Under construction are the Coastal Plains Conservation Field Station at Florence, S.C., and the Northern Plains Soil and Water Field Station at Sidney, Mont.



# SCS Helps Repair Land Damaged by Montana Flood

By P. E. Farnes

*Acting Snow Survey Supervisor, SCS, Bozeman, Mont.*

**R**AMBLING streams and non-chalant rivers became elements of horror and destruction the second week in June when Nature released upwards of 10 inches of precipitation on the melting snowfields and mountains of northwestern Montana.

When the rivers and streams finally receded, they left behind an estimated \$70 million in property damages. Some 30 persons were dead or missing.

Front page coverage in the newspapers is gone; now the hard work of rebuilding lies ahead.

As soon as water began to recede, SCS conservationists and technicians were in the field. New irrigation ditches were surveyed to provide water for land still having a possibility of producing a crop this year.

Hydrologists checked flood flows and design figures for a watershed protection plan being prepared for Birch Creek below Swift Reservoir. The application had been received before the flood.

## SCS Moves Men

Downstream, agricultural land required much work to restore full production. The SCS transferred additional personnel into those areas, to assist farmers and ranchers recover as soon as possible. It is estimated that 1,500 man-days of technical work will be required.

Immediately after the flood special snow surveys were made to assess the potential for additional flooding. Measurements were made on June 16 to 18 at 27 high elevation snow courses in Montana.

Even after the heavy rainfall and much melt, the snowpack was still large. Many locations had as much snow the third week in June

as is normal for the last week in May. The potential was still high for more flooding should warm temperatures be accompanied by moderate to heavy rainfall.

But Nature did not unleash her fury again. Rivers and streams continued to run bank-full into July with only minor flooding.

What caused the worst natural disaster ever to hit Montana?

According to early reports from valley and foothill areas, 5 to 11 inches of rain fell in 30 hours. This amount was probably exceeded in the mountains.

Rain, falling on the melting snow, increased its rate of melt. Surfaces not snow-covered contributed substantially to the runoff, since most of the soils were still saturated from recent snowmelt.

Similar quantities of rainfall on either a cold snowpack or on dry soil would not have produced as much runoff. It could have been larger only if the soils had been frozen.

Earlier in June the future looked bright. Irrigation reservoirs were filling with runoff from the melting mountain snow. The area was finally receiving moisture after 5 years of semidrought. Crops were a little slow because of the cool spring, but would respond to warming temperatures.

## Snowmelt Was Late

Earlier in the winter, snow accumulation in the mountainous headwaters was below average. During April snowmelt was well below average because of the cool spring. On May 1 the measured snowpack was about 20 percent above average for that date. Cool weather continued through May, keeping the snow in the mountains. Early

in June, temperatures began warming and snowmelt raised streams to nearly bank-full, but not to flood stage.

Then the deluge hit.

Crops were swamped. Livestock was carried away. Roads, bridges, railroads, and fences were no more. Water stored in irrigation reservoirs rushed down the Missouri River after dams gave way.

Swift Reservoir on Birch Creek, unable to withstand the surge of water, collapsed — adding nearly 30,000 acre-feet to the already swollen streams. Lower Two Medicine Reservoir and small city water supply dams also burst.

## Potential Flood Danger

The 1964 Montana flood reminds us that in this mountainous region we must live with unpredictable flood hazards. Snow surveys can forecast the total water yield of a drainage area with reasonable accuracy, but they cannot foretell when a combination of weather conditions may bring the water supply—whether large or small—down at flood rates.

Each spring in Montana presents a potential for devastating floods. The western part of the State is mountainous and the majority of the watersheds are snow-covered throughout the winter and into spring.

The peak flow of a river each year is not simply a function of volume of snow; it is related even more to temperature and precipitation during snowmelt. As happened in 1964, serious floods may occur from a snowpack that is below average during the winter months.

This yearly flood potential makes it urgent for Montana land owners and conservationists to make needed land use changes and complete watershed treatment to provide reasonable protection from the inherent hazards of the environment. Even with today's modern technology, the solution is not an easy one.



## LAND LEVELING IS INVESTMENT FOR RANCHERS

A \$35 AN ACRE investment begun 10 years ago in the leveling of irrigated hayland for greater efficiency is expected to bring within 2½ years a 40-percent return to two brothers near Steamboat Springs, Colo.

When John (in photo) and Stan Fletcher bought the 1,900 acres of ranchland along the Elk River, 260 acres was of average production, but the high and low places were of low yield. After a while the Fletchers also discovered they were in need of more hay to carry their livestock through long winters.

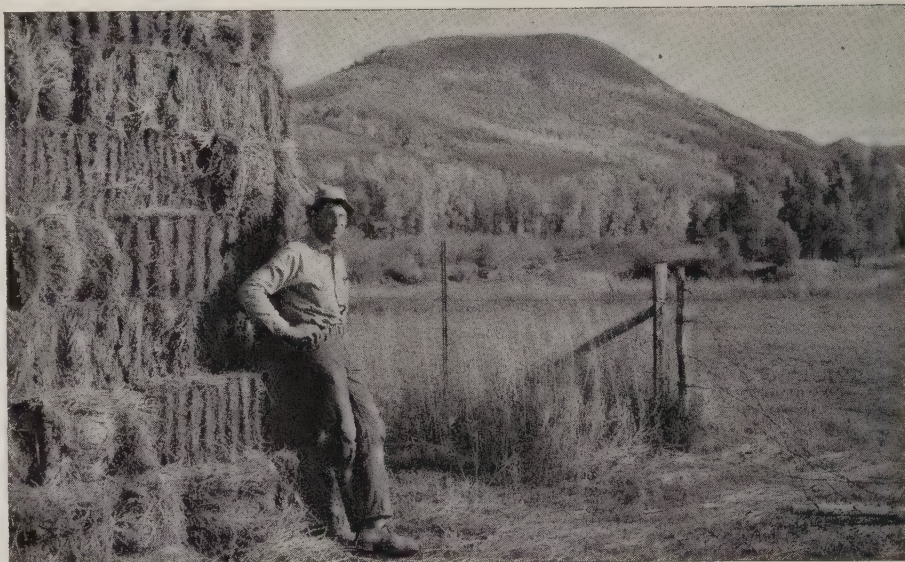
The brothers became cooperators with the East Routt Soil Conservation District and developed a long range soil conservation plan. They decided to level the irrigated land for greater efficiency. They would do the job at the rate of 20 acres a year.

The brothers investigated the cost of having the work done, then decided to buy a 2-yard scraper and tackle the job on their own.

First, they plowed the field in the fall. The next spring they plowed it again, smoothed and seeded it to oats. The following fall SCS technicians lent a hand with the engineering involved, designed the leveling job, and set the stakes.

Final touches completed, they planted a grass-legume mixture. Subsequently yields were from 3 to 4 tons of good quality hay an acre. The Fetchers have leveled 190 acres.

Said John Fetcher, "We think we have top production from this land now, but once you get top production you have to keep at it to maintain that level. Irrigation water management after you have leveled land is one of the most important parts of the job."—BRUCE A. LINDAHL, *work unit conservationist, SCS, Steamboat Springs, Colo.*



## CONSERVATION ESSAY WINNERS



Among the many conservation essay contests sponsored by soil conservation districts is that of the Lee County Soil and Water Conservation District of Arkansas, open to high school students.

Here Harvey Wilson, chairman of the Board of Supervisors, presents cash awards to winners from the Anna Strong High School: Carthelia Jordan (center), first, and Lela Dukes, second.



# State Highway Construction And Soil and Water Conservation

By M. J. Snider

Chief Engineer, Missouri State Highway Department

*These remarks are excerpts from an address to a statewide staff conference of SCS soil conservationists in Jefferson City, Mo., June 18.*

*For many years the Soil Conservation Service has enjoyed excellent cooperation with the Missouri State Highway Department in roadside erosion control work and related activities.*

*Typical of the joint projects are two combination floodwater-retarding and stabilization structures that replace bridges in the East Branch of the South Fork of the Blackwater River Watershed Project.*

*In the Pike County Soil and Water Conservation District the Highway Department permits the board of supervisors to use highway rights-of-way for Reed canary-grass sod banks for use of local farmers and is cooperating in an evaluation study of trailing raspberry for bank stabilization. — HOWARD C. JACKSON, State Conservationist.*

**T**HE Missouri State Highway Department realizes that sound programs of erosion and drainage control are good investments. It is an established fact that such measures, undertaken during construction of a new highway, save money in the long run because future maintenance costs on the road are considerably lower. Also, the prevention of damage to pavements, shoulders, and bridges from water action provides for safer and more convenient operation of vehicles by motorists.

During calendar year 1963, the Missouri State Highway Department carried on a construction and right-of-way program amounting

to about \$175,700,000. Out of this, \$3,185,000 was used entirely for erosion and drainage control programs which already had been proved workable and beneficial.

A breakdown shows the following categories of work and money for each purpose: Paved ditches, \$981,000; concrete slope protection, \$170,000; fiberglass matting for drainage ditches, \$112,000; interception ditches, \$36,000; erosion control netting, \$48,000; sodding \$586,000; seeding, \$437,000; mulching, \$576,000; and rock fills and revetments on river and stream banks at bridges and box culverts, \$239,000.

## Land Use Changes

All of us are aware that any changes in land use—whether it be in farming methods, home and commercial construction, or highway building—disrupt established drainage patterns because the natural state of the land has been disturbed.

For example, heavily urbanized areas present special problems in attempting to deal with water control to prevent flooding and erosion.

A new highway built in St. Louis County and running, for instance, past an open 80-acre field probably would call for only routine drainage control measures to take care of runoff and erosion as long as the adjoining land stays in its same state.

But suppose this field is developed intensively with houses, industry, and huge shopping areas with parking spaces for hundreds of automobiles. This would change the whole complexion of the situation.

Obviously, with roofs of buildings, new streets, driveways, and surfaced parking lots, there will be tremendous increase in water runoff because open ground areas to absorb precipitation would be cut drastically. This excess water must be taken care of if there is not to be severe flooding, with its resulting damage and inconvenience.

So in designing erosion and drainage control features for new highways in these expanding urban areas, we attempt to gain as much knowledge as possible in anticipation of future changes.

Information that is very helpful to us, for example, is projected land use data and local zoning designations. Of course, if a highway is designed under a certain zoning designation, and then that designation is changed in the future, there could be trouble ahead.

## Erosion and Runoff

Let's turn to the rural areas now and see what the State Highway Department does in soil and water control measures there. . . . Watershed runoff and historic flood data are two of the key pieces of information the department uses in determining the height of roadbeds and bridges and the design of drainage facilities. This is true for urban and rural areas.

Naturally, we all know that flood records in particular areas frequently are broken, and this sometimes will cause a highway to be flooded. But we believe historical flood data provide the soundest guide we can use . . . Historical flood data are revised upward by the Highway Department when unusual storms occur.



Another vital factor in setting erosion and flood control designs for highways is soil testing. Extensive tests are made for each project and the results evaluated. Different drainage and erosion control measures are required, of course, where erosive soil exists than in nonerosive soil areas.

It also is important to note that the State Highway Department employs a full-time graduate agronomist. One of his main duties is to determine the best type of grasses and other ground covers to plant along rights-of-way to prevent erosion and beautify the highway.

### **Agency Cooperation**

I want to mention, too, the cooperative efforts which we carry on with other groups.

The State Highway Department works closely with the U.S. Corps of Engineers in designing bridges and highways to be built in areas under the Corps' jurisdiction. Examples of this are bridges constructed over the Mississippi and Missouri rivers and roads and bridges that are relocated through lake areas.

The Highway Department also has a Memorandum of Understanding with the Missouri Conservation Commission. The memorandum provides for the exchange of programs and preliminary study information whereby the efforts of the two agencies are co-ordinated toward the reduction of damage to Missouri's fish and wildlife resources.

Research plays an important role in the State Highway Department's program of erosion and water control.

### **Soil Conservation**

In 1957 the department awarded a contract for building about 16 miles of U.S. Route 24 in Lafayette County. The highway was to cut through land that had been intensively terraced at considerable cost to adjacent landowners.

The landowners and soil conservation people were interested in the department designing the highway so as not to change the soil conservation factors then existing.

Under the department's design policy at that time, the high velocity of water outflow through culvert pipes would have caused extensive damage to existing ditches and terraces.

The department was happy to cooperate with the Soil Conservation Service and Lafayette County Soil and Water Conservation District in attempting to find an answer to the problem. A new type of headwall for cutting down the velocity of water coming through culvert pipes was designed for the pipes by our Division of Surveys and Plans. The new headwall resulted in reducing the water velocity coming out of a pipe about  $4\frac{1}{2}$  to 1.

The cost of the new headwall was considerably more than the standard headwall normally used. The adjacent property owners agreed to pay the difference to test the design as a research project.

A total of 30 culvert pipes ranging in size from 18 to 42 inches in diameter was installed. Cost to the landowner was \$250 on each 18-inch pipe and \$950 on each 42-inch pipe.

So successful was the project that these headwalls now have become a part of the department's standard specifications in areas of Missouri where erosive soil exists.

### **Fiberglass Matting**

Another successful research project involved the use of fiberglass matting, instead of concrete, for drainage ditches requiring a surface.

The test was carried on along a highway in Callaway County late in 1961. The fiberglass was simple to install, since it comes rolled up like a blanket.

It was spread on a graded surface and anchored to the ground

with "T" pins. Asphalt then was sprayed on the blanket to add strength and weight and also to seal it. The asphalt was covered with rock chips to add more strength, provide protection against abrasion, and catch silt to make a smooth surface.

The performance of the fiberglass was checked after experiencing all types of weather conditions, and the results were found highly satisfactory. Moreover, it costs about 30 percent less than concrete to install by contract. As a result of this successful research project, fiberglass matting now is being used rather extensively for this type of work by the department in areas with erosive type soils.

The Missouri State Highway Department will continue to expand its programs of research, cooperation, and action in matters pertaining to conservation so the needs of the public can be served even better in the future.

### **Conservation Quotes**

"As long as our streams run red, as long as our creeks and rivers flood fertile bottom land, as long as crops suffer and die because of too much or too little water, as long as gullies scar out hillsides, and as long as any farmer and his family live in want because land is abused or water wasted—our job is never finished."—DR. J. B. DOUTHIT of the Pickens (S. C.) Soil Conservation District.

"We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect."—ALDO LEOPOLD.



University of Nebraska Engineer James Pichon designed a robot-controlled tractor that starts, stops, blows its horn, and raises or lowers implements at predetermined points without the aid of man.



# Unified Planning

(Continued from p. 29.)

village officials were prompted to apply to their own district headquarters for soils inventories and maps "like those in the Hanover Report." Furthermore, they proved willing to share in the costs of making the surveys and producing the interpretive materials. This tangible support served to amplify the districts' ordinarily limited manpower and the service was thereby accelerated.

Survey and interpretation assistance has, to date, been furnished to 14 towns, and 12 others have contracted for reports now under development. Two multitown regional areas have also contracted for more generalized surveys, and several communities where swift urbanization is expected have asked for detailed data. Thirty-six other towns are awaiting their turn. For this and associated work, the entire SCS soil survey staff in Massachusetts is scheduled into 1966.

At the heart of the current movement is a "natural resources evaluation" procedure which many communities follow in preparing their master plans. The conservation districts provide the technical information for the resource inventory. Steering committees representing town-wide governmental interests prepare lists of community objectives on water supplies, population, economy, and other factors that affect their future.

Resource teams provided through the districts then work with the planners to insure that no inter-relationships, no alternative sites, and no optional land uses are overlooked. The culmination of such an approach results in more tangible and realistic master plans. Such a master plan includes a "Future Land Use Map" matching town objectives with its "storehouse" of resources.

Vital followup is also provided by conservation districts. Help is

given in planning and scheduling operations where natural resource use and protection are clearly involved. Finally, the district remains at the side of the community officials in the design and supervision of all measures where the welfare of the natural environment is at stake.

The steps underway fulfill much of the philosophy of the Rural Areas Development and Technical Action Panel concepts currently being advanced by the Department of Agriculture. Rural and urban interests have been given an effective means of working together harmoniously.

## Capital Residents Get Field Courses In Natural History, Conservation

A unique conservation education program that reaches key Government employees, officials of national conservation organizations, and urban residents of the Nation's capital is conducted by the Graduate School, U. S. Department of Agriculture. The Soil Conservation Service provides several of the instructors.

The special program of "Natural History Field Studies" is carried on in cooperation with the Audubon Naturalist Society of the Central Atlantic States, with headquarters in Washington. Field courses in fall and spring take students to examples of the principal ecological communities of the region and give them an opportunity to observe conservation and land-

use problems and their treatment.

In the 3 years the program has been in effect more than 250 people have enrolled in 1 or more of the 16 courses offered. Each course gives 1 hour of college credit.

Students have included one congressman, congressional staff members, several high-ranking employees of the major executive departments, including Agriculture and Interior, military officers, and officials of conservation organizations.

SCS employees helping to teach the courses are Robert E. Williams, Resource Development Division; Ben Osborn and A. B. Foster, Information Division; and Earle D. Matthews, soil scientist on the Maryland State office staff.



Members of class in "Introduction to Outdoors" quiz Paul Pearson (bareheaded), cooperator with the Montgomery County, Md., Soil Conservation District, about his operation of a shooting preserve.





**CONSERVING AMERICAN RESOURCES.** By **Ruben L. Parson.** 2nd ed. 1964. Prentice-Hall, Inc., Englewood Cliffs, N. J. 521 pp., illus. \$8.95.

This second edition strengthens and brings up to date Dr. Parson's popular book on conservation. In it teachers have a reliable and readable book for classroom use; laymen a lively, stimulating discourse on one of the Nation's most vital concerns—the whole range of natural resources on which our very life depends.

The book follows closely the pattern and content of the successful first edition. The material has been reorganized somewhat to present a more logical sequence; some new material added, including a chapter on "Mineral Fuels and Major Metals;" and the statistics and references carefully brought up to date.

This is a book that squarely and forthrightly presents the central thesis of the conservation movement as represented by the Soil Conservation Service and soil conservation districts. Naturally, much of the information has been

obtained from those sources. The activities and subject matter of other agencies of the Federal Government, and of academic and private institutions, have been generously used as well.

The book assumes "an optimistic viewpoint;" in fact, the first paragraph carries just that label as a marginal heading. The optimism is reflected throughout in a readable and piquant style.

The author's definition of conservation will convey something of the philosophy and flavor of the book:

"Conservation of natural resources means the fullest possible use of them without abusing the ones exploited, without destroying any needlessly, and without neglecting any that can be used. It is not necessarily 'conservative' in the ordinary sense of the word. It means thrift, but not denial; frugality, but not privation; efficiency, but not austerity."—B.O.

## New Publications

**Water Facts.** By **Soil Conservation Service.** Issued Aug. 1957. Rev. May 1964. *USDA PA-337.* 14 pp., illus. Water sources, supply, needs, uses, losses, floods, and conservation with some emphasis on recreation and wildlife.

**The Work of the Soil Conservation Service.** Rev. June 1964, *USDA SCS-CA-4.* 7 pp. Summary of activities of SCS with citations of legislative authority.

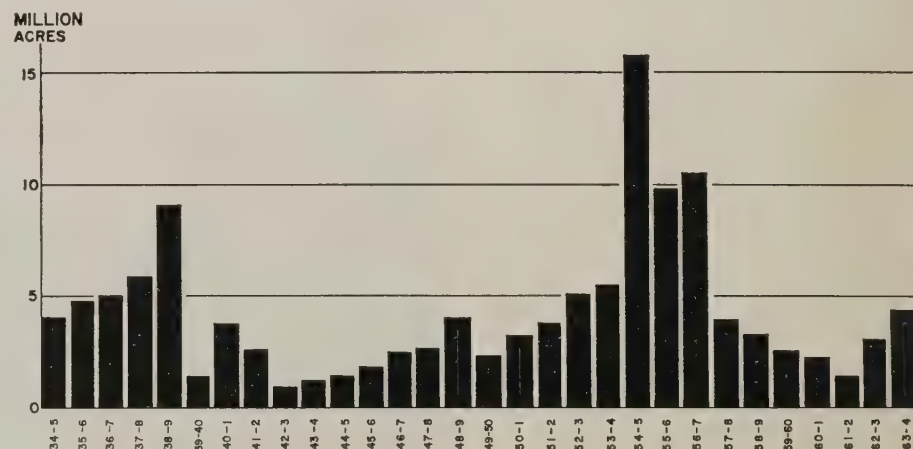
**Local Secondary Effects of Watershed Projects—A Case Study of Roger Mills County, Oklahoma.** By **J. Dean Jansma and W. B. Back.** May 1964. *USDA ERS-178.* 28 pp. Local economic benefits of watershed projects arise from (1) net primary income, or increases in net incomes of the direct recipients of products and services from the projects, and (2) net secondary income, or increases in net incomes of other local people through multiplier effects of the primary income. Local primary income has been estimated by the SCS in the process of project planning. Practical methods for making reliable estimates of local secondary income in the planning process are yet to be developed. This study represents an initial step in research to devise these methods.

**Pesticide-Wildlife Studies.** By **John L. George.** June 1963. *U. S. Dept. of Interior, Circ. 167.* 109 pp. A review of Fish and Wildlife Service investigations during 1961-62.

## Land Damaged by Wind Erosion in Great Plains

The final report of wind erosion conditions for the 1963-64 blow season showed the largest acreage damaged of any year in the past 7, and an upward trend in area damaged during the past 3 years. Estimates from local SCS offices in 183 counties in the 10 Great Plains States indicated 4,295,937 acres damaged.

The 30-year record of wind erosion damage includes data from the Great Plains Council for the period 1943-44 through 1952-53, from SCS for the other years.



The number of counties reporting wind erosion damage varied from year to year but included the active wind erosion area of the Great Plains.



From the Administrator:

## *SCS Services To Urban Areas*

**T**HE applied programs of the Soil Conservation Service have long contained bonus benefits for the individual and groups — both rural and urban. Benefits from the work of SCS today extends increasingly to the nonagricultural land user.

Direct technical assistance is being provided for school grounds through protection from erosion by controlling excess water runoff. Assistance on runoff problems is being provided for airports and highways. And States and municipalities find SCS technical assistance an invaluable asset in stabilizing and developing recreation areas.

Still another SCS program containing nonagricultural benefits is the National Cooperative Soil Survey, the basic tool of our profession. The soil survey used to guide land use adjustments for the orderly planning and application of soil and water conservation on farms, ranches, and watersheds, is now paying dividends for the nonagricultural user as well.

Many soil survey interpretations that aid in establishing soil and water conservation measures on the farm can be used equally well for nonagricultural purposes, such as locating soils for housing, sewage disposal, industry, highways, airports, and general town planning.

Using the soil survey, industry finds the proper place to build, homeowners and builders locate the best place for houses and septic tanks, and counties and municipalities choose the proper sites for reservoirs, highways, pipelines, and sewage systems.

Annually SCS is providing soil surveys for about a million acres in areas of urban expansion. In fiscal year 1964 the million acres

involved 70 urban areas. The work in these areas is being carried out in cooperation with soil conservation districts, much of it with financial assistance from towns, counties, and municipalities.

As urban planning groups become more aware of available soil survey information, requests for such information will increase. Indications are that city planning commissions are the groups most interested. In fiscal year 1964, 32 urban planning groups in 12 States signed agreements with SCS for soil survey information.

Soil conservation districts in many States are also beginning to realize the value of the soil survey in urban planning. District programs are being updated and revised to include assistance to land users in urban-fringe areas and municipalities.

Districts are leading out in this movement and are working with urban planning groups to plan for all the needs of the community, both rural and urban. This is a trend that is pronounced in the northeastern urbanized area. It is a trend we believe should and will be followed by other soil conservation districts containing areas of urban expansion.

SCS has the technical know-how and long years of experience that town planners, State agencies, and individuals find valuable in developing the natural resources of the community. We have made good use of this experience and knowledge in the past. We are making good use of it now. We will make far more use of it in the future.

As our population increases and cities and towns spread more and more into rural areas, soil surveys will play an even larger role in the development of these areas.

Through proper planning we can meet these additional demands on the land while striking a blow at rural poverty and heading off the specter of rural-urban slums.

Unlike many less fortunate countries, the United States has enough land to meet the many needs of the individual and public and private organizations. But with a million acres of land going out of agriculture each year, mostly from cropland to urban-fringe areas, we must apply wise planning to this land use shift.

Using the soil survey as a starting place, the SCS for nearly 30 years has practiced applying soil and water programs suited to each acre of land. During that time the problem of soil erosion has been dramatically diminished.

Through the small watershed program, towns and cities have gained new life by curbing floods and making multiple use of water impoundments.

Now we are faced with the challenge of using the experience and knowledge gained from these programs to help solve the rural-urban competition for land. Here we must plan to meet the needs of both rural and city people and still maintain an adequate agricultural base. The nature of the soil survey makes it a key tool for meeting this challenge.

The multipurpose concept used in applying SCS practices and programs will pay dividends in the years ahead. We need only to include these urban area needs in our regular planning and gear our efforts to meet them. The time has come to put to work some of the planning we have done and prepare for additional responsibilities in a growing America.

—D. A. WILLIAMS



GOVERNMENT PRINTING OFFICE  
DIVISION OF PUBLIC DOCUMENTS  
WASHINGTON, D. C. 20401

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID  
PAYMENT OF POSTAGE, \$300  
(GPO)

If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

---

## Conservation at the Jetport

Story on Page 36





OCT 8 1964

OCTOBER 1964  
VOL. XXX, NO. 3

CURRENT SERIAL RECORDS

# Soil Conservation

WOODLANDS IN RESOURCE CONSERVATION: KEY GOALS—Page 51

*A Woodland Economy—Page 59 Using Soils Information—Page 63*





# Soil Conservation

## *The Broad View . . .*

AFA's 20 Key Goals for Conservation (p. 51) refute any notion that foresters can think of nothing but trees. We have noted in previous issues the broadening horizon of soil conservationists, the expanding role of SCS, and the modernization of soil conservation district programs to treat all kinds of resources. The broad-gaged program presented by the forestry association shows that dedicated group also moving in the direction of concern for all renewable natural resources as an inseparable package.

**District RAD:** For months we have been hearing reports of the economic revival of a rural community in the Northwest based on resource development and led by a soil conservation district. Finally, our Information Director Harper Simms and Tarleton Jenkins (Denver) went to Thompson Falls, Mont., talked to people, and came back with a fine set of pictures documenting a real example of Rural Areas Development (p. 59) based on the use and conservation of woodlands.

**Cover Picture:** Woodlands fit naturally into a pattern of conservation land use in this Wisconsin farm scene. Photo by E. W. Cole.



## CONTENTS

- 51 Key Goals for Conservation**  
Districts support AFA Program on private land  
*By T. B. Plair*
- 53 Lumber Is Our Crop**  
Tennessee brothers harvest pine and hardwoods  
*By C. M. Henninger*
- 55 Brady's Hills Ski Area**  
Family farm recreation plan realizes dream  
*By James M. Cooper and Merrill D. Ray*
- 58 The Search for "Ecotypes"**  
Special strains of grasses bring success to plantings  
*By M. D. Atkins*
- 59 Conservation District Builds Woodland Economy**  
In Montana's Clark Fork Valley
- 63 Soils Information for Woodland Planning**  
*By Paul E. Lemmon*
- 66 Ohio Conservation District Aids Water Development**  
*By Willis J. Ridenour*
- 67 American Forestry Association**  
*By Kenneth B. Pomeroy*
- 69 Profile**  
District Tree Farmer: Monroe Samuel
- 69 Review**  
Tomorrow's Wilderness; Approved Practices in Soil Conservation
- 70 School Forest Provides Income**  
*By Don L. Richardson*
- 71 From the Administrator**  
Woodlands in the Conservation Program

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

Editor  
BEN O. OSBORN

Editorial Assistant  
GEORGIE A. KELLER

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Prints of photos can be obtained on request.

**Subscriptions:** Price \$1.50 per year, \$2.50 foreign. Single copy, 15 cents. A discount of 25 percent will be allowed on orders of 100 or more sent to the same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.



# Key Goals for Conservation

## Soil conservation districts support AFA program on Nation's private woodlands

By T. B. Plair

Woodland Conservationist, SCS, Washington, D. C.

### 20 KEY GOALS

Control Forest Insects  
and Diseases

Prevent Forest Fires

Protect the Soil

Multiple Use for Maximum  
Benefits

Reforest Denuded Areas

Conserve and Improve  
Water Supplies

Provide Opportunities  
for Recreation

Improve Wildlife Habitat

Revegetate Rundown Ranges

Eliminate Fraudulent  
Mining Claims

Improve Access to  
Public Property

Expand and Intensify Research

Keep Resource Surveys Current

Assist Landowners  
and Processors

Utilize Available Credit

Adjust Property Taxes

Strengthen Educational  
Programs

Consolidate Land Holdings

Improve Utilization  
and Marketing

Cooperate With Other Nations

THE "Conservation Program for American Forestry," presented to the people of America as a policy statement by the American Forestry Association, finds ready endorsement by private landowners and professional soil conservationists.

Much of the program is already under way in soil conservation districts and small watershed projects across the land.

The AFA program was formulated by bringing together leaders in the related conservation fields of forests, soils, water, and wildlife to rough out the framework of the policy. The finished product was endorsed by the Fifth American Forest Congress in 1963 and approved by referendum of the association membership. It is the third such policy statement in 20 years.

The program has been published in *American Forests* Magazine, reproduced as a pamphlet, and widely distributed. For ease of understanding, it is summarized as "20 Key Goals," reproduced on this page.

To soil conservationists the most striking characteristic of these goals is their familiarity. They include many of the same goals that the Soil Conservation Service has helped apply in soil conservation districts and other phases of the national soil and water conservation program.

To appreciate the closeness of this Conservation Program for American Forestry to the programs of the SCS and soil conservation

districts, we need only look at the accomplishments recorded on selected ones.

### Protect the Soil

The prevention of soil erosion and deterioration was the initial mandate of the SCS. Ravages by water and wind still spell ruin for much of our land each year. The loss of tilth, fertility, moisture-holding capacity, and other desirable properties of the soil may be as serious to some landowners as the loss of an inch of topsoil itself. So, protection is needed against both loss and damage.

One widely used practice to protect soil is planting of windbreaks. During the past 30 years 145,000 miles of windbreaks have been established. Even so, there is still an estimated need of more than 300,000 miles of new windbreaks. The management, including replacement, of windbreaks may be an even more important job than the initial establishment.

Many other conservation practices are being used by landowners in soil conservation districts to prevent soil losses and damage. Amounts (in acres) of some important practices on the land are:

Conservation cropping system .....	131,705,000
Crop residue use .....	94,000,000
Range proper use .....	176,000,000
Woodland proper grazing .....	7,642,000
Stubble mulching .....	16,969,000
Woodland improvement .....	11,483,000

### Reforest Denuded Areas

During the past 30 years, tree planting on private land, now mostly in soil conservation dis-



tricts, has resulted in one of the most dramatic changes in land use since the plow broke the plains. This change has been from generally soil-wasting to consistently soil-conserving use.

Some 9.8 million acres have been planted to trees by landowners with some assistance from both the forest industries and the public. This includes hundreds of acres of strip-mined areas and other mechanically disturbed surfaces which have been covered with new protective growth of trees and shrubs. Mostly this job has been done by individuals, some assisted by small contractors with one or two tree planters.

Soil interpretations in terms of suitability for tree crops, with special attention to species suitable for each soil, have been particularly helpful in many areas. With such information we can locate the soils suited to species most valuable for production of wood crops and those unsuited for tree planting of any kind.

Conservation needs estimates suggest that 72 million acres of non-Federal land needs establishment or reinforcement of tree stands; i.e., trees should be planted or seeded either on open land or in partially stocked areas. The more nearly this job is completed and the marginal conditions are approached, the greater will be the need for accurate interpretations of soils information.

### **Conserve and Improve Water Supplies**

The small watershed program, under the Watershed Protection and Flood Prevention Act of 1954, has sparked an intense interest and much activity in water conservation and development.

In the total of some 575 watershed projects now in operation or completed, water impoundments have provided needed supplies for irrigation, for cities and industries, and for wildlife and recreation, in addition to reducing flood

and sedimentation damages. Reforestation and woodland improvement have played an important part in the conservation treatment of these watersheds.

### **Provide Opportunities for Recreation**

Much of the tree planting done with SCS planning assistance has resulted in improved recreation opportunities. Even though the primary objective was land use that would provide effective erosion control and soil stabilization, planted areas in most instances soon resulted in improved wildlife habitat. Better hunting followed.

Species often were chosen to enhance game production. Woodland borders were planned and established with wildlife as a primary consideration.

In many woodlot management plans, including specifications for cutting practices, game as a companion crop was an objective of land owners and operators. Much tree planting has been done to protect watersheds, large and small, as a means of improving water quality and water yield so important to fishing and other recreation uses of ponds, lakes, and streams.

Prior to the enactment of the Food and Agricultural Act of 1962, wildlife and recreation values resulting from woodland conservation practices had been regarded essentially as auxiliary or incidental benefits, as important as they may have been on many land areas.

Since enactment of that legislation greater emphasis is being placed on outdoor recreation as one of the several alternative uses to be considered in land use planning.

Recreation may be a primary objective in certain situations and by certain land owners and operators. In such cases, wherever woodlands or potential woodlands are involved, their establishment or treatment and management for recreation purposes becomes a

part of the basic soil and water conservation plan for the farm, ranch, or other land unit.

Research and observation tell us that desirable space for many outdoor recreation enterprises has a combination of three basic ingredients: water, trees, and open areas. These natural recreation resources are needed for camping, picnicking, hiking trails, and nature areas. The combination enhances hunting, fishing, and other activities also. Soil conservation programs generally result in developing these three elements together for more effective recreation use.

### **Improve Wildlife Habitat**

Most landowners who use any conservation practices do something that benefits wildlife. As yet, there has been no satisfactory way of evaluating the total benefits to wildlife habitats of the many conservation practices that are part and parcel of most good conservation farming.

Some indication of the many wildlife values found in the improved uses of soil, water, and plant resources are suggested by these accomplishments reported by districts: Wildlife habitat preservation, 5.9 million acres; wildlife habitat development, 2.4 million acres; fishponds stocked, 619,000. Add to these such things as stripcropping, 19 million acres; pasture planting, 38 million acres; and croplands converted to wildlife uses, 2 million acres—to say nothing of the woodland planting and improvement and the windbreaks mentioned previously—and it is not difficult to see that wildlife has derived many benefits from the conservation practices in use by cooperators in soil conservation districts.

The need for further development of habitat for wildlife is extremely difficult to estimate. It is safe to say that interest in wildlife is being greatly stimulated by the increase in outdoor recreation.

*(Continued to page 68)*



# Lumber Is Our Crop

*Tennessee brothers harvest pine and hardwoods from timbered hills near Copper Basin*

By C. M. Henninger

*Woodland Conservationist, SCS, Cleveland, Tenn.*

**J**UST 7 miles away from the barren wastes of the Copper Basin in Polk County, Tenn., pine and hardwood trees grow in well-managed stands on the hills of the Kimsey brothers' farm.

In contrast to the famed biological desert created by fumes from

a former smelter plant, brown trout lurk in the clear stream running through bottom land where cattle graze on orchardgrass and clover pasture.

The peaceful but prosperous appearance of this Turtletown Creek farm near the North Carolina line is the result of meticulous care of 50 years, culminated by nearly a decade of planned conservation in cooperation with the Polk County Soil Conservation District.

In contrast, too, was the condition of the farm when the father of Floyd, Oren, and Deyo Kimsey bought it in 1913. Then, all merchantable timber had been cut. "Only a few trees were big enough to cut a 2 by 4," Oren said.

"We thought that there would be a future in growing timber," said Floyd. "We took pains to keep out fire and encourage the better trees. We cut only what we had to have to supply the farm with lumber, and to fill bills of materials for houses and barns being built in the area. Most of this was from dead or dying trees."

And indeed there has been a future in "growing timber." Since 1957, 260 acres of woodland has produced 1.1 million board feet of lumber, an average of 4,300 feet an acre. It was sold for \$73,919.40, and netted a profit of \$37,936.08.

Another 60 acres will be cut this year—the seventh "compartment" in the 7-year, sustained-yield cutting cycle outlined in a farm conservation plan worked out with the district.

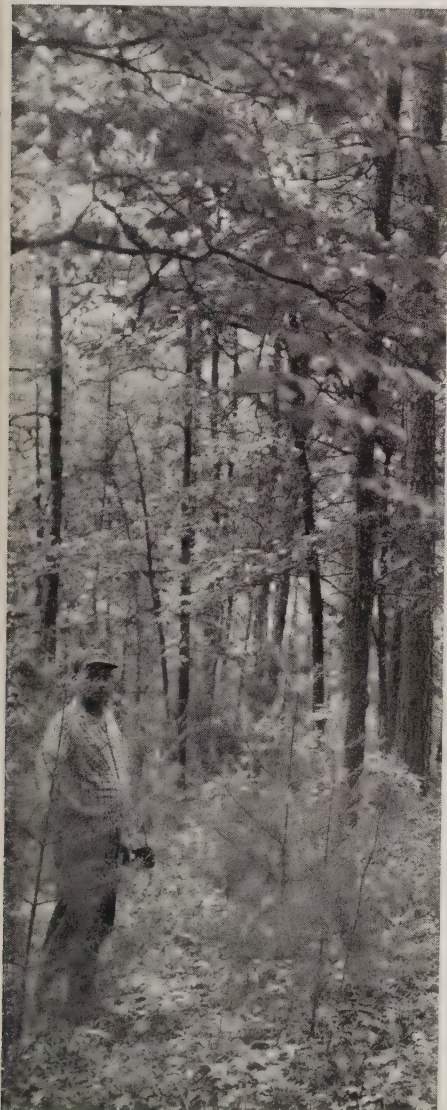
The brothers helped to organize the district in 1956, and Floyd has served as a member of the Board

of Supervisors since that time.

The Kimseys sell lumber, not standing timber. Trees to be cut are selected and marked by foresters from the State Division of Forestry and from the wood-using industry. The trees are measured, and the brothers shop around for a buyer for the lumber that can be cut from the trees.

Then they contract for the logging, sawing, and hauling.

When a tree is cut, they mark the log to insure a large amount of 16- to 20-foot lumber, and to keep down waste in the tree tops. They work with the sawmill men to see that the lumber is processed to the specifications of the buyers.



Floyd Kimsey checks young white pine reproduction.



Erosion scars the hills of denuded Copper Basin.



Oren (l.) and Floyd, two of the Kimsey brothers, sit on logs from one white pine tree that contained 1,200 board feet of lumber. In the background neighbors inspect lespedeza bicolor border planted to provide food for quail.

A nearby copper company has bought most of their pine lumber at \$80 a thousand board feet, and from \$42 to \$60 for oak lumber. Their net income has been \$34.51 per 1,000 for all lumber. Average stumpage prices in the area are \$25 for pine and \$15 for oak, as scaled by the Doyle rule.

Deyo tells about a special order for a white oak beam 6 inches by 12 inches by 36 feet. It took a lot of looking, he said, but they found one big enough to fill the bill.

The 420-acre farm has gradually changed its character during the 50 years under Kimsey management. As the woodland developed to stabilize the farm enterprise fewer and fewer acres were planted to cultivated crops.

Its present form emerged in a 1956 conservation plan worked out by the Soil Conservation Service through the district. They set



aside 100 acres of bottom land for pasture and hay for 40 registered Angus cattle, and a small field for corn. The Kimseys had the highest per-acre corn yields in Ten-

nessee in 4 of the last 7 years. Their highest yield was 240 bushels an acre on 5 acres.

The woodland was divided into seven compartments and has been selectively harvested according to the plan each year except 1960, when prices were low.

Shortleaf pine is the principal timber species on the farm. On Fannin and Talledega silt loam soils the "site index" indicates a height growth of about 70 feet in 50 years.

Good stands of shortleaf, Virginia, and white pine, and of oak are developing in the logged areas. Young pines now growing in the compartment cut in 1957 are more than 10 feet tall. By the end of the second 7-year cycle, most of the area will have pulpwood-size trees to be thinned.

After each cutting the brothers go over the area with tree injectors

"We sell lumber, not standing trees." Left to right, Deyo, Oren, and Floyd Kimsey stack lumber they have harvested. Their farm conservation plan divides their woodland into seven compartments for rotation cutting.





and kill unwanted trees, and repeat the kill about 4 years later if needed.

But trees are not the only things the Kimseys like in their woodlands. There are quail, grouse, squirrel, and rabbits in abundance. Oren, the oldest of the brothers, favors the brown trout in the creek. Recently he landed one that measured 23 inches.

Floyd finds time to serve as scoutmaster for the local Boy Scout troop. Few youngsters have as good an opportunity to learn the lore of the forests—and the meaning of woodland management and soil conservation.

"We will be selling timber from our woods as long as we are here," says Floyd. "And whoever gets the farm after we are gone will have good timber."

## Brady's Hills Ski Area

*Family farm recreation plan realizes dream of four generations in Michigan woods*

By James M. Cooper and Merrill D. Ray

*Area Conservationist, Jackson, and Soil Conservationist, Stanton, Mich.*

**B**RADY'S HILLS ski area, near Lakeview, Mich., is a dream come true. The idea was originated by Brede (pronounced Brady) Paulson, who purchased the present holding in the late 1870's primarily for timber production. Brede was an ardent skier in his native home of Risa, Norway, and his love of the sport was shared by his wife.

Unfortunately, however, Brede

did not live to see his dream become a reality. It was 1956, 6 years after his death, that his son Arthur cleared the first ski runs.

The ski area is nestled among 400 acres of second growth hardwoods. In the 1890's 8 million feet of virgin red oak was cut from this woodland. Since that time many feet of piling have been cut for local bridge work and for docks along the east coast of Lake Michigan and Saginaw Bay area.

The woodland is part of 740 acres which Arthur Paulson and his two sons—Jack and Rick—operate as cooperators in the Montcalm County Soil Conservation District. They have a complete soil and water conservation farm plan which Soil Conservation Service personnel helped them develop.

Timber stand improvement recommendations of Lloyd Cogswell, Michigan Department of Conservation's District Forester, are part of the overall conservation plan. Future operations call for cutting all salable timber and underplanting the oak stand to faster growing white pine.

"Timber stand improvement has always been an outstanding feature of the Paulson farm," according to R. W. "Wally" Petersen, who owns the farm adjoining the Paulsons. Petersen is a director of the Montcalm County district and also a director of the National Association of Soil and Water Conservation Districts.

Brady's Hills is an excellent ex-

When it's time to eat, get warm, or talk skiing with the other fans, the Redwood Inn is the center of attraction.





ample of a family farm operation using recreation to supplement farm income. As part of their coordinated conservation plan, the Paulsons use cover crops, crop residues, conservation cropping systems, plow-planting, and waterways to conserve the soil and water resources on their 320 acres of cropland. This year the Paulsons helped Montcalm County retain its status as the leading producer of colored beans in the United States by raising 120 acres of them.

In 1962 and 1963 they established 80 acres of wind stripcropping to help control wind erosion on their loamy sand soils.

They plan to install tile systems on the imperfectly and poorly drained soils of the farm. A newly constructed shallow surface ditch will provide surface drainage on 60 acres of the Paulsons' farm and 30 acres of an adjoining farm.

For their great progress in planning and application of soil and water conservation practices, the Montcalm County district awarded them a district cooperator sign this year.

Ski runs in the Lakeview area were nonexistent before 1956. The closest were at Grand Rapids—50



**Skiing is good sport for the little ones as well as their parents. An employee in the ski lodge fastens a tow ticket on a young customer.**

miles to the south—and Cadillac—80 miles north. Local enthusiasts from Lakeview—desirous of good skiing locally—encouraged the Paulsons to proceed with their ski runs. This interest proved to be the incentive the Paulsons needed.

Six ski runs were developed in 1956. Now there are 10. One rope tow was operated by a gasoline engine in 1956. The 1965 season

will see 6 electrically operated rope tows, using a total of nearly 8,000 feet of rope.

The whole ski operation has been completed with family labor and tools except for 10 hours of heavy bulldozing. Local carpenter help was also hired to complete the finish work on the ski lodge.

This winter, newly installed snow-making equipment will as-



**On a winter weekend, the ski runs, cleared out of the wood, and the snow-covered field are a busy area. Stripcropping in the foreground protects the Mancolona loamy sands from wind damage.**



sure good skiing. More than 1 mile of pipe will be in place to facilitate snow making. A new 8-inch well will supply water. Art says: "Snow-making equipment is a must in our area." Natural snow at Brady's Hills last season afforded only two fair weekends of skiing.

Brady's Hills skiers are primarily 1-day participants. Weekend skiing by local fans constitutes the bulk of the trade. Charles Miel, lawyer from nearby Stanton, says: "Brady's Hills provides an opportunity for local skiers to enjoy the sport without traveling a long distance."

Many out-of-State skiers also use Brady's Hills. According to Jack, many customers stop for a day's skiing on their way to or from larger ski areas to the north. And some skiers use local lodging at the Lakeview Hotel and local motels to spend a complete weekend at the Paulson's ski area.

A good Sunday afternoon will find 300 to 400 skiers at Brady's Hills. The Paulsons plan to develop their slopes to accommodate 1,000 skiers a day.

Rick, a certified ski instructor, and 3 other instructors provide ski instructions to more than 400 persons a year, including many local district cooperators and their families.

Redwood Inn, just west of the ski slopes, is the pride and joy of Genevieve and Janice Paulson, Art's and Jack's wives. They serve lunches to skiers and operate a reservation service for banquets during off-ski months.

All of the Paulsons ski, except Genevieve. Even Jack's 3-year old son, Brady, is already on skis. He stands to benefit a great deal from the dream of his great-grandfather and the efforts of his grandfather and father.

The Paulsons plan to expand to other recreation enterprises as soon as time and finances permit. Summer facilities, such as trails

and picnic areas in the woodland area, are being considered. Also, fox hunters in the area claim that the Paulson farm affords them the best of hunting.

Perhaps the sentiment of the community towards Brady's Hills is best summed up by "Wally" Petersen's statement: "I have watched the progress of this family

farm operation with interest. Here is a fine example of teamwork, wise land use, and a deep concern for soil and water conservation." Significant, too, is the fact that the Paulsons hire about 10 local people during the ski season to assist with ski patrolling, ski equipment rental and sales, and help in the Redwood Inn.

## FISH POND IN PUERTO RICO



This sign of the State Penitentiary Farm in Rio Piedras, Puerto Rico, proclaims that the pond was constructed by the San Juan Soil Conservation District in October

1962, and that it was stocked with Tilapia on January 25, 1963. The Soil Conservation Service provided technical assistance through the district.



# The Search for 'Ecotypes'

## Special strains of grasses bring success to plantings in specific areas

By M. D. Atkins

*Plant Materials Specialist, SCS, Denver, Colo.*

**T**HE development and release of grass varieties adapted for use in specific and limited geographic areas is the result of extensive testing and research by Soil Conservation Service plant materials specialists and their colleagues in Federal and State experiment stations.

In the Great Plains, where grass is so important, much of the work has been devoted to a search for adapted "ecotypes" to meet specific field needs. In recent months, the work has been intensified in response to the requirements of the Cropland Conversion Program. Special effort is being concentrated at the Plant Materials Centers at Bridger, Mont., and Bismarck, N. Dak., to find additional ecotypes for the portion of the northern Great Plains still lacking adapted varieties.

An ecotype is a subdivision of a species or other biological unit that thrives best in a specific environment, often quite limited in extent. Within each grass species there may be many ecotypes that reflect the conditions of climate, soil, and site of their different origins.

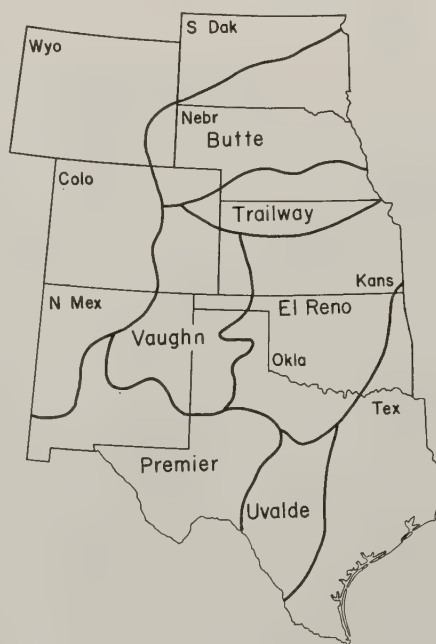
SCS plant materials workers take collections representing such ecotypes to the plant centers for initial evaluation and increase. The aim is to develop varieties or strains for a specific area, site, soil, or field condition. Selections that appear to have value are further studied in field plantings on farms of soil conservation district cooperators.

The SCS collecting and testing work is not the only effort of this kind. In some States research

workers also are breeding, selecting, testing, and developing grass varieties that have value in the conservation program.

Much more progress has been made with some grass species than with others. For example, six varieties of sideoats grama have been released and are commercially available. All have been used to some degree in range seeding and in other permanent plantings. Each is best adapted to a specific geographic area.

Further field collections of sideoats grama are being assembled to determine if selections can be made that are better adapted in certain sections of the northern Great Plains than the varieties presently available.



**Areas of best adaptation in the Great Plains for six varieties of sideoats grama that have been released and are commercially available.**

Similar progress has been made with other grass species of importance in the Plains. The Blackwell, Caddo, Grenville, Neb. 28, and Kanlow varieties of switchgrass have specific geographic and site adaptations. The same is true for Cheyenne, Holt, and Neb. 54 indiangrass and the Kaw, Woodward, Elida, Pawnee, and Champ strains of big bluestem and sand bluestem. There is a need for adapted varieties of little bluestem, western wheatgrass, bluegrama, and other grass species that have important conservation uses.

For the program of variety development to be a success, it must be generally accepted that one variety is superior to others for a specific geographic area. This fact is recognized for cultivated crops but not generally for grasses.

Variety names are being made a part of SCS technical guides and specifications. Grass variety or seed origin is usually indicated by seeding specifications for seeding range, planting pasture, establishing vegetation on watershed structures, and seeding highway rights-of-way.

In some States the Great Plains Conservation Program and ACP practice specifications reflect an increased cost-share rate for adapted varieties. As adapted named varieties are developed, accepted, and used, grass seedings and conservation treatment on the land will be more effective.

### Resource Development

Resource development, in either rural or urban areas, consists of identifying, unifying, improving, and using the human, natural, and physical resources available to achieve more satisfying living.

### Clover-grass Pastures

University of Tennessee Extension dairy and livestock specialists report that good clover-grass pastures produce more milk and beef than straight permanent pastures.



## In Montana's Clark Fork Valley ...

# Conservation District Builds Woodland Economy

**A**N unusual combination of business enterprise, resource conservation, and local leadership has brought new economic stability to a broad timber-producing valley in northwestern Montana.

An area of hitherto marginal farming with only brief periods of prosperity, the 60-mile-long valley of the Columbia River's Clark Fork had previously experienced only two periods of general economic well-being: during a brief interval when dairying was profitable and again when scores of workers came in to build a power dam.

### Result of Big Burn

Much of the valley floor—10 miles wide in places—is covered with stands of pine, fir, and larch of small diameter. The uniform size, oldtimers explain, is a result of "the Big Burn" in 1910.

For years the Green Mountain Soil and Water Conservation District, which serves the valley's 200 farmers, had been searching for a market for the area's most dependable crop, its small timber.

In the summer of 1960, George Reller and his two sons, Glenn and Dale, sold their interest in a sawmill at Bozeman and began looking for a site for a modern all-electric sawmill. Reller believed that a successful business could be built on the use of small logs like those of the Clark Fork area.

The hunt led to Chairman Paul K. Harlow of the conservation district's board, who had already been talking to mill operators in the area about buying locally produced trees for pulp.

The outcome was a contract between the district and the Rellers in which the district agreed to supply a continuing flow of wood from the valley's farmlands or from the adjacent National Forest. The Rellers agreed to build a mill to specialize in the kind of timber available.

The district in turn worked out an agreement with the farmers to sell their timber on a continuing basis for 20 years. The initial price was \$13 a cord, to be adjusted periodically according to the Western Pine Association index.

The Soil Conservation Service stepped up its work in making and interpreting soil surveys as a guide to best use of woodland sites and in conservation planning.

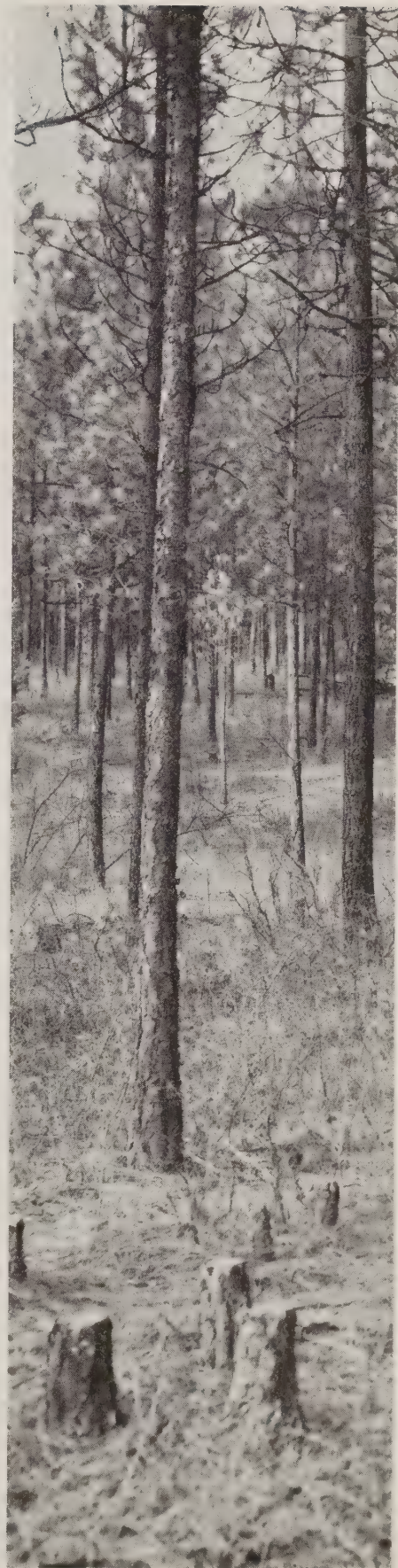
Other Federal and State agencies—Forest Service, Farmers Home Administration, Agricultural Stabilization and Conservation Service, Extension Service, and the Montana State Forester—provided special help for farmers.

State and Federal foresters assisted in the harvesting program. ASCS authorized funds for cost-share help in timber stand improvement. The FHA made loans, based on complete conservation plans for land and improvements.

### Small Business Loan

The Rellers obtained a \$350,000 loan from the Small Business Administration and \$60,000 in Rural Electrification Administration

**Most woodlands of Clark Fork Valley are trees of small diameter. Thinning and pruning release them for faster growth.**







The new sawmill at Trout Creek brought economic stability to Clark Fork Valley. The Green Mountain S&WCD negotiated the contracts that made it possible.

The chipper, which turns peeled slab into salable pulp for paper manufacture, is important part of equipment. Dale Reller checks output.

Major product is 8-foot 2-by-4's cut mostly from small diameter logs. Here they ride a chain carrier to drying kiln.

Former District Supervisor B. R. Jobling operates his loader for the 4-mile haul from his farm to the sawmill, Lower center: Lloyd Austin, a supervisor of the Green Mountain district, bought equipment and works full time in logging operations. Here he talks to Ronney Pirker (c.), owner of 160 acres of woodland, and SCS Conservationist George Gable.







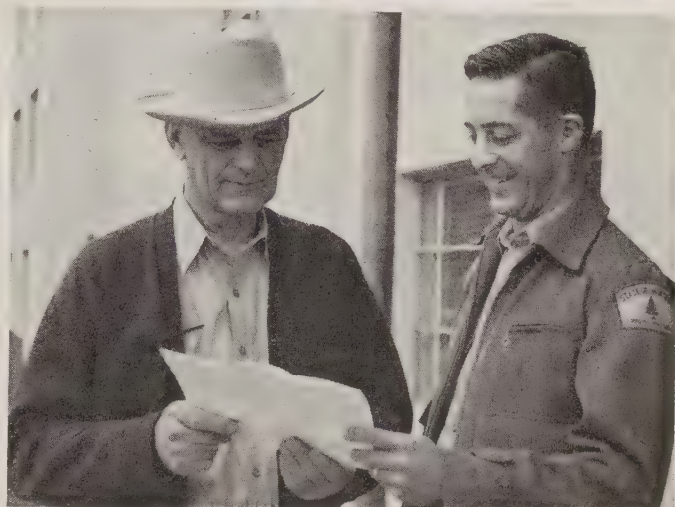
Operators of the mill are the Rellers—George (l.) and his sons, Dale and Glenn.



From 8 to 5, on week days, Andy Marich of the White Pine Community operates the "head rig" at the Trout Creek mill. He operates a dairy farm and sells timber on a continuing basis under the district's contract.



County Agent J. H. Mikkelson (l.) of Thompson Falls and Forester Charles (Chuck) Wright of Missoula, of the Montana State Forester's staff, both have played leading roles in the valley's woodland development.



Glenn Hill of Belknap pauses at the scale as he delivers a load of small logs to the Trout Creek sawmill, one of the few in the Northwest buying logs by weight.





funds. First State Bank of Thompson Falls participated in the SBA loan to the extent of 10 percent. A total of \$780,000 was spent on construction of the plant. While the mill was being constructed, the Rellers were stockpiling logs.

The mill began operation in the summer of 1961.

By September 1 that year, the farmers had delivered 4,757 cords, for which they received about \$62,000. The mill's payroll for August 1961 was \$17,014. The August payment to farmers for logs was \$19,000. Payments to farmers and mill hands have continued at about the same pace.

President Glenn H. Larson of the First State Bank said business of his bank immediately reflected the new activity and income. The mill, he said, is on a sound footing with a healthy operating outlook.

An auto dealership operated by

the Gill brothers, Henry and Robert, reports a 20 percent increase in sales of both new and used cars.

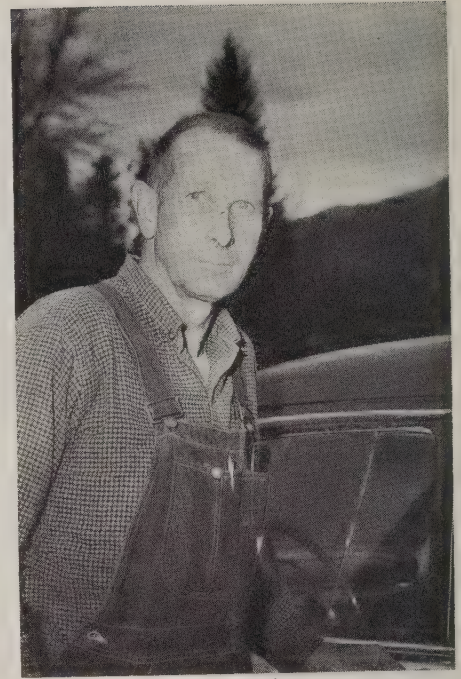
And newspaper publisher K. A. (Doc) Eggensperger says his advertising sales are reflecting the general business improvement.

### Farmers Respond

Farmers who were barely able to keep their enterprises going are enthusiastically entering into the new arrangement. They are investing in farm improvements, equipment, and in household appliances they had not enjoyed previously. Many are harvesting their own timber, a recommendation of conservationists.

When the mill shut down for a brief period the immediate drop in business reflected it.

The mill buys logs in 8-foot lengths or in 8-foot multiples, as small as 5.6 inches at the smaller



**Paul K. Harlow, chairman of Green Mountain District Board, led the hunt for a market for the valley's main crop—trees—that led to a contract between the district and the mill.**



**Farmer Herb Kraus, who drives the school bus and harvests logs on his farm, drops into the grocery at Trout Creek. John (c.) and Joe Cernik, operators, see the healthy impact of the mill and its jobs on business in the valley.**

end. It mills mainly 2-by-4 studs.

The addition of chipping equipment to make use of the peeled slab has proved a sound investment. The chips go by rail to a paper mill in Lewiston, Idaho.

Chairman Harlow of the Green Mountain district believes an ample supply of logs for the mill can be harvested on a conservation basis year after year. Until the flow of logs can be increased, the district is also buying logs from public land on the adjacent mountain slopes.



### Rural Areas Development

Rural Areas Development is a major USDA effort to keep all farm communities prosperous and to restore prosperity to those bypassed by technological developments.

The Government's Rural Areas Development Program is designed to help people who help themselves—not to provide all the answers or all the financing.



# Soils Information for Woodland Planning

By **Paul E. Lemmon**

*Soil-Woodland Specialist, SCS, Washington, D. C.*

**S**OME soil areas are excellent for growing timber but some are of poorer quality. Many are not productive enough to justify forest management. Others, although productive, have important management hazards and limitations that prohibit or severely restrict their use. Many areas could more appropriately be dedicated to other uses, such as range, wildlife habitat, and areas of human recreation.

How do we distinguish between the good and poor areas for timber production, the areas best suited for agricultural crops, and those that should be devoted to other important uses associated with forest cover? This is an important land-use question, because about a third of our total land area is woodland.

A wealth of scientific information and practical experience are available about soils, climate, and related subjects to help make these decisions. The information needs to be interpreted and presented in a way that permits its use by land-owners.

## Soils Are Key

Soils are the result of the combined "forces" of the environment. Each kind occurs in characteristic locations, and reoccurs whenever the same conditions are found. Soil scientists have developed methods of describing, in the field and in the laboratory, the many different soil characteristics. They can show by soil-mapping units, the location and extent of each different kind of soil.

Each can be interpreted separately for different uses, such as cultivated crops, pasture, range, engineering, and woodland.

In making full use of soil maps for woodland planning, it is helpful to consider the methods of developing woodland interpretations of soils by rating items which limit their uses for trees. For most of the items, adjective ratings of *slight*, *moderate*, and *severe* are generally used to express relative degrees of suitability.

## Determining Suitability

Determining woodland suitability of soils includes: (1) Rating soils, (2) grouping them to simplify the presentation of information, and (3) summarizing the information in easily understood and usable ways.

We rate soils—each different kind shown on soil maps of a survey area—for two kinds of things: (1) Biological responses of crops, such as forest trees or forest types, and (2) physical performance of soils under management treatments.

The most commonly rated items are:

**(1) Potential soil productivity** for designated woodcrops (tree species or forest types). Ratings come from measurements of total height and total age of selected dominant and codominant trees in stands growing on identified soils.

Adequate sampling of different kinds of soil provides a usable average site index. This can be translated, through published forest research, into:

**(a)** How much yield can be expected at various ages.

**(b)** How big we can expect the trees to be at certain ages.

**(c)** How many trees of certain size will occur in fully stocked stands.

Potential soil productivity is

basic to any economic considerations of woodland management.

**(2) Species suitability** for different kinds of soil. What species is most suitable for each different kind of soil, either to plant, if this is the method selected for regeneration, or to favor for final harvest trees if you are managing existing stands?

These ratings comprise priority listings of suitable trees for planting, or preferred species to favor in managing existing stands.

**(3) Seedling mortality** (or regeneration potential) of each soil. What can normally be expected in terms of survival and establishment—largely in the first and second years—after planting, or after treatments designed to provide natural regeneration? Soils differ in this respect when compared under comparable conditions.

**(4) Equipment limitations**, sometimes called trafficability. This includes suitability for such things as planting equipment, seedbed preparation equipment, trucks, different kinds of tractors, and specialized logging equipment. All such operations are influenced by such soil conditions as wetness, fineness, or coarseness of soil texture, stoniness, and the like, and by such physiographic conditions as steepness and shape of slope. These factors interact to cause limitations or restrictions in type and use of equipment.

**(5) Plant competition** (or brush encroachment) is affected by kind of soil. It influences management decisions to assure adequate establishment and growth of new stands. Ratings are based on ecological and silvicultural research.

**(6) Erosion hazard** is an item which can be of considerable im-



portance even though forests are considered one of the most erosion-resisting land uses. Usually erosion results from a disturbance of vegetative cover and is often a critical factor in maintaining roads, trails, landings, and others. In addition, the offsite influences of flooding and sedimentation need to be considered in planning woodland management treatments or operations.

Over the years, we have accumulated much information about the relative erosiveness of different soils when the cover is disturbed and are thus able to rate each soil-mapping unit.

**(7) Windthrow** (or blowdown) of valuable timber is a serious hazard on some soils and for certain species. This is especially true during periods of high wind and soil wetness. The problem may be aggravated by timber cutting.

**(8) Pest and disease hazards** are sometimes related to different kinds of soil.

The Texas leaf-cutting ant, that interferes with regeneration of pine stands some places in the South, is a good example of a pest hazard that is soil related. The probable severity of its activities can be related to soils as shown on maps.

The littleleaf disease of pine is an example of a disease that is related to soil conditions.

**(9) Suitability for special products** is an item of importance in managing many woodlands. These may be major products in some cases, but generally they are supplemental to other forest products to be harvested. Such things as Christmas trees, decorative greenery, maple syrup, turpentine, and even range, wildlife, and recreational values, may be rated. These ratings take the form of *well*, *moderately well*, and *poorly* suited.

### Suitability Groups

Soil surveys are made to serve many users—farmers, livestockmen, horticulturists, foresters, en-

gineers, hydrologists, and others. In short, soil surveys are made for all those interested in land-use planning. To serve these many users it is often necessary to make more soil separations on a map than are needed to serve any one user. For this reason, we group soils to simplify the presentation of information for different uses.

Usually, all the soils in a survey area can be combined, with the help of the ratings discussed above, into a few groups that show the significant relationships needed for woodland uses. Each woodland suitability group is made up of soils that produce similar kinds of woodcrops; that need, under the same vegetative conditions, similar management to produce these crops; and that have about the same potential productivity.

### Summaries for Users

We summarize the information and make it available for woodland users. Such summaries have been included in many recently published county soil surveys.

These summaries include a table showing the soil-mapping units organized into woodland suitability groups. There is a generalized description of each group. Then, for each group, there is a complete list of the soils included; a statement of the average potential productivity for important tree species or forest types; average ratings of the items discussed above; and a brief discussion pointing out how the ratings may influence management decisions.

Summaries of soil-woodland interpretations are available for use as soon as they are developed. The information is on hand in offices of the Soil Conservation Service in the form of technical guides. These are available for use in areas where published soil surveys are not yet available.

Soil-woodland interpretations are being summarized for major land resource areas within which soil, climatic, and other conditions

are similar. This information by resource areas provides efficient use of public information beyond the political boundaries of county lines.

### Using the Information

Using woodland suitability information in land-use planning can be most helpful by: (1) Identifying areas of similar woodland suitability; (2) subdividing these areas to show present stand and condition information; and (3) combining this with other current information as an aid to selecting fields or treatment units.

These subdivisions show the extent and location of areas that are similar both with respect to woodland suitability and present stand and condition of existing vegetation. Management prescriptions can then be made for these subdivided areas, and their responses and yields can be predicted.

Using soils information as described provides a basis for considering both the physical and biological resources of each separate ownership. Equally important in woodland planning is consideration of the individual operator's circumstances and the conditions confronting him in making best use of his woodlands.

### Gully Control

Many gullies are created by accelerated erosion resulting from man's misuse of the land. These gullies should be controlled. USDA Farmers' Bulletin 2171, prepared by the Soil Conservation Service, recommends these methods:

Fence in the small- to medium-size gullies having small drainage areas and keep out livestock.

Plant gullies in adapted species of grass, shrubs, or trees used separately or in combination.

Divert runoff away from a gully head by a diversion ditch or by terraces or contour furrows.

Change gullies to grass waterways.

Use structural measures.



## Field Windbreak Patterns Protect Irrigated Sand

**D**RY sand and wind make for hazardous farming in Portage County, Wis.—without conservation know-how, that is. Add water and windbreaks and you have a winning combination.

The stakes are high. Potatoes, snap beans, cucumbers, sweet corn, peas, and other high profit crops give extremely high yields under irrigation and proper fertilization. And there is a vast reservoir of water beneath the central Wisconsin sand plain that covers the southern 40 percent of the county.

Wind erosion is still a big problem due to the erosive nature of the soil and the intensive farming practices required to grow the most desirable crops. Progressive landowners know that permanent solutions must be found.

A leader in the battle against erosion has been the Okray Produce Company which has teamed up with the Soil Conservation Service to find the best species of trees to grow in the sand of the region.

This teamwork began with trial plantings along the Wisconsin



**Maturing red pine windbreaks protect irrigated potato land in Portage County SCD.**

River. Willows, poplars, and elms were tried along with some eastern ninebark and siberian peashrub. Some of the early plantings are still around, but experience to date has shown red pine to be the all around best bet for this sandy country.

Since the trial plantings, Okray Produce Company has set out more than 5 miles of pine windbreaks. Some are single-row red pine, some are 3-row red pine, and some 3-row red and white pine. These

are planted with the red pine in the outside rows and the white pine in the middle. They are all spaced 660 feet apart and in a north-south direction.

Of the windbreak plantings made in 1959, Farm Manager John Okray says, "They are only 6 feet tall but already we can see the protection they give."

Older windbreak plantings have already proved their worth and have encouraged vegetable growers to follow suit.

## SCSA Meeting Theme Is Time, Space, and Demand for Resources

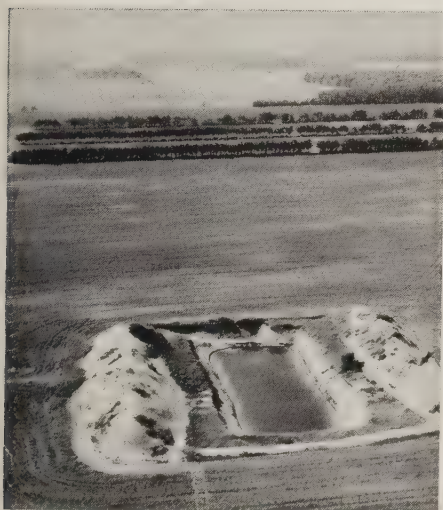
"Time, Space and Demand for Natural Resources" was the theme of the 19th annual meeting, Soil Conservation Society of America at Jackson, Miss., Aug. 23-26.

The Society's membership of more than 10,000 unites the interests of all scientific and technical disciplines related to "the art and science of good land use."

Its 10 technical study committees, at work on policy statements as guidelines for their fields of interest, reported at the meeting. They are: Conservation Education,

Conservation Economics, Conservation Research, Land Use Planning and Zoning, Land Utilization, Mined Area Restoration, Outdoor Recreation, Professional Training, Urban-Suburban Conservation Problems, and Water Resource Management.

One day was devoted to field trips. One tour visited cotton farming in the delta. Others reviewed southern hardwood forestry, southern pine forestry, a watershed project, and the U. S. Army waterways station.



**The combination of irrigation water, obtained here from a pit dug in high-water-table sands, and field windbreaks makes vegetable growing practical.**



# Ohio Conservation District Aids Water Development

**W**ATER development projects are receiving priority attention from the Soil Conservation Service and other agricultural agencies in Jackson County, Ohio, this year because of a decreasing rainfall over the past 2 years that has left most wells and ponds at a record low level.

The special effort on the part of the Jackson Soil and Water Conservation District and cooperating Federal agencies will help double water-development projects as compared with previous years.

After last summer, with just enough water, landowners have sought help to insure against another year of critical shortage. The Jackson County Soil and Water Conservation District supervisors in their January planning meeting gave water-development projects first priority for 1964. The action authorized SCS to give more time to landowners who need water, according to District Chair-

man Wayne Brown.

Agricultural Stabilization and Conservation Service granted additional money to projects for cost-sharing assistance to landowners needing water. Farmers Home Administration declared emergency loans may be granted to farmers for water development at 3 percent interest rate. Extension Service has begun to inform landowners not familiar with services available to them.

In developing soil and water conservation plans with SCS technicians a landowner has the opportunity to weigh advantages of alternative possibilities of a pond or spring development. Several landowners who already have developed some water sources said it was well worth the cost and some have made plans for developing more water sources.

Attorney George Scurlock of Lick Township received ACP cost-sharing for developing a spring

for livestock in 1962. "I would have had real water shortage during last year's drought if it weren't for the spring development," he said.

George Smalley, a Scioto Township farmer and chairman of the Rural Areas Development Agricultural Committee, said he has a pond and two spring developments for livestock water. He said he plans further to develop a hillside seep into a spring this year.

The George Smalley spring will be developed by intercepting the hillside seep with field drintile. The collected water will flow into a small catchbasin, and the overflow will be gravity fed to a 500 gallon cement tank.

Another Jackson County cooperator, Thornton Wilson, developed a wildlife pond during the summer 1962. It was designed, and construction was supervised by SCS technicians. Wilson has since expressed great satisfaction with the facility as a source of water for fire protection, recreation, and other benefits as well as an attraction to wildlife.

The experience of Jackson County landowners over the past few years has deeply impressed them with the importance of water to rural area development—WILLIS J. RIDENOUR, *work unit conservationist, Jackson, Ohio.*

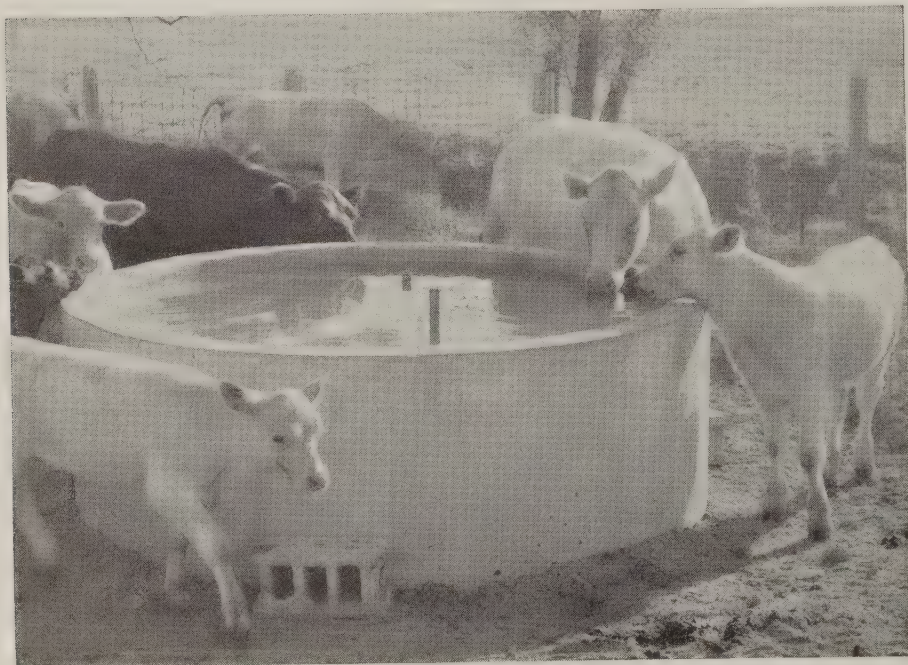


## Increase Size of Farm

Virginia economists believe that the problem facing the State's agriculture in the future is increasing the size of farms. It is essential that the farm be large enough that the farmer can afford to own and operate modern machinery.

## Gravel Mulches

Laboratory and field studies reported by Colorado State University engineers show that gravel mulches constitute a promising method of reducing evaporation from bare soil subject to frequent light rains or irrigation.



A spring development provides clear drinking water for George Scurlock's beef herd.



# American Forestry Association Sponsors Multiple Use, Conservation

By **Kenneth B. Pomeroy**

Chief Forester, AFA, Washington, D. C.

**T**HE American Forestry Association, which holds its 89th annual meeting in Asheville, N. C., October 18-21, can well share with its meeting place the motto, "Cradle of Forestry in America," which also is the meeting theme.

Created in 1875, AFA is one of the Nation's oldest conservation organizations. It was active in the late 1800's in the campaign for creation of the Federal forest reserves—later to become the National Forests.

Biltmore estate near Asheville, established in the same period by George W. Vanderbilt, became in 1889 the site of the first forestry school in America. Two years later Vanderbilt hired Gifford Pinchot to take charge of Biltmore Forest with instructions to make it an example of practical forestry in America.

Biltmore estate is now one of the conservation showplaces of the Southeast, and nearby are such forest attractions as the Pisgah National Forest and Great Smoky Mountains National Park which association members will visit during the meeting.

The American Forestry Association, with a membership of about 40,000, advances nonprofessional understanding and interest in forestry and conservation in general.

Its objectives, as initially defined were "to secure forest preservation (by) — education, leading the public mind to see the necessities of the situation; and legislation, establishing proper methods of dealing with the situation."

The only major change in this statement of purpose occurred in the early 1900's after the forest reserves had been withdrawn from

homestead entry by presidential proclamation. The association adopted "Conservation Through Wise Use" as its guiding principle.

The wise use concept recognized the desirability of assigning areas of unusual character to special uses, such as park, reservoir, wilderness, or refuge. It also recommends that other forest lands be managed for all compatible uses in order to provide maximum benefits to the economy and to society.

These multiple uses include production of timber, water, forage, and wildlife plus opportunities for outdoor recreation.

The association attempts to implement its program by the impartial presentation of relevant facts in *American Forests Magazine*, by providing direct contact with nature through its Trail Riders of the Wilderness, by preparation of books such as *Knowing Your Trees*, by conducting special projects such as fire prevention campaigns, appraisal of forest resources, and studies of land ownership, by review of regional problems at annual meetings, and by periodic analysis of national trends at Forest Congresses, and by presenting the association's views to the Congress of the United States.

## WATER LEVELING IN KOREA



Land leveling under water may be a new technique for American rice farmers, as reported in the June issue of *Soil Conservation Magazine*, but a reader submits evidence that it is a traditional practice in the Orient.

John R. Ulrich of Spokane, Wash., contributed the above pic-

ture of Koreans plowing their fields under water. "Being a great admirer of the inventive genius of the Koreans (iron-clad war vessels and radiant heating hundreds of years before their occidental discovery)," he says, "I'm convinced that they knew about water leveling all along."



# Key Goals

(Continued from p. 52)

This will create a demand for more wildlife and therefore better habitat, and possibly a greater appreciation of the multiple benefits of conservation farming.

## Revegetate Rundown Ranges

During the past 30 years landowners in soil conservation districts have been assisted with surveys of their ranges to determine sites and conditions on 67 million acres. Plans made by ranchers with SCS professional guidance include appropriate conservation practices for range improvement, including reseeding.

The need to improve and protect plant cover is still a major need on America's rangelands. Conservation needs data indicate that more than 365 million acres of non-Federal rangeland needs establishment or protection of plant cover.

## Assisting Land Owners and Processors

As applied in soil conservation districts, this means helping land owners plan and apply coordinated conservation and resource-use plans to their entire holdings; i.e., to help them appreciate the benefits of using each acre within its capability and treating each acre according to its needs for continuous effective conservation use.

The SCS's responsibility is to help landowners appreciate what is needed, why it is needed, and how to do it or get it done.

This is a continuing job; it will never be finished. The fact that SCS has assisted, through and with the help of soil conservation district governing bodies and others, 1½ million out of the 4.8 million land owners and operators in the United States, does not suggest that the job is a third done. If land owners were always the same and their conservation problems were always the same, and if the

answers to all the problems were known, then we might assume that a third of the job was completed.

Instead, this job of assisting landowners to plan and apply conservation treatments to their land is broader than it was 30 years ago when the SCS was still an infant. This is so because we continue to learn how to do more conservation jobs and to do them in a more effective way; land owners discover that they need more conservation treatments than they originally thought; and the objectives of resource use change with changing conditions. The whole land use field is a volatile, seething, melting pot of social, economic, and technical change. Each major shift in land and water use calls for more intensive, and ordinarily more expensive, conservation treatments.

As an example, field windbreaks in the northern Great Plains as installed 30 years ago usually were 7 to 10 and even 20 rows wide. Today, many 1-row field windbreaks are being planted.

Width and composition of modern windbreaks vary with the objectives of the plantings as well as the physical conditions of the sites. They are different from earlier plantings because improved species are now available, planting techniques are improved, and cultivation and weed control methods and machines are improved. The windbreak job today is not the same as 30 years ago.

Similar technological changes have occurred for most plant technologies. Social changes likewise have affected the way land is used.

## The Other Goals

The other Key Goals are of interest to all conservationists and are of direct concern to many. They are objectives to be sought wherever there is the need for them to serve human resources. Each of them, appropriately implemented, can contribute significantly to the realization of maxi-

mum benefits through multiple use of natural resources.

Noting the relationship between some of the Key Goals and the work already accomplished by soil conservation districts is another way of endorsing the American Forestry Association's Conservation Program. It certainly suggests a oneness of purpose among conservation organizations and agencies and the opportunity through cooperation to advance the intelligent management and use of forests and related resources of soil, water, wildlife, and outdoor recreation.

## Sediment Threat Stirs Landowners

BOWMAN-SPRING Branch watershed in southern Nebraska is a scene of concerted activity by local residents who are trying to reduce the threat of silt in new floodwater dams developed in the watershed project.

Although incomplete, the watershed project has already begun to halt erosion, channel debris, floods, and sediment.

Three of eight floodwater-retarding dams are already built. In order to protect these from sediment damage landowners hurriedly are applying land-treatment measures suggested by the Thayer County Soil and Water Conservation District and the Bowman-Spring Branch Watershed Conservancy District plans covering 5,328 acres, or nearly one fourth of the watershed area.

This portion of the watershed is under the Great Plains Conservation Program, and half of the land being treated under the program is in the drainage above the floodwater-retarding structure sites.—RICHARD D. JISKRA and HARRY W. BELL, *Soil Conservationists, SCS, Hebron, Nebr.*





## Monroe Samuel

Arkansas

### District Tree Farmer

**A** STRONG pillar of the national farm woodland program is from Hope, Ark. Farmer, cattleman, cotton grower, good citizen, and area vice-president of the National Association of Soil and Water Conservation Districts—that's Monroe Samuel.

Recognized by the wood-using industries several years ago for his progressive farm forestry efforts, Monroe Samuel proudly displays his Arkansas Tree Farm sign.

He has engaged in sound farm forestry on 600 wooded acres of his 1,200-acre farm. His woodlands are selectively cut according to his woodland plan. He is capable of marking his own woodlands for all types of wood products. He applies timber stand improvement to remove cull and weed trees and make room for his fast growing pine and high quality hardwoods, consisting of cherrybark red oak, sweetgum, and white oak. Additionally, he has planted over 50,000 trees on his farm at DeAnn, near Hope, Ark.

Monroe Samuel was one of the first farmers to cooperate with the Hempstead County Soil and Water Conservation District. That was back in the 1930's. From an active cooperator, he became a supervisor of his local district; has since served as area vice-president, then as president of the Arkansas Association of Soil and Water Conservation Districts; as a director and now vice-president of the National Association; and on the NASCD committees for woodland and research.

Paramount among Mr. Samuel's many interests has been the woodland conservation program in his local soil conservation district. As a member of the board, he helped

to pioneer the idea of making woodland conservation tools and services available to woodland owners. For example, the district lends tree injectors and provides chemicals to woodland owners who wish to do their own timber stand improvement work. For those unable to do their own work, the district has sponsored a contract crew that functions like the pond building contract service.

At present, Monroe Samuel advocates that districts encourage their cooperators to place their woodlands under the protection of the Arkansas Forestry Commission.

When more progress is made in the conservation district woodland program, look to Monroe Samuel.



**TOMORROW'S WILDERNESS.** Edited by Francois Leydet. 1963. *Sierra Club, San Francisco.* 262 pp., plates. \$5.75.

In 1949 the Sierra Club sponsored the first Wilderness Conference. Since then conferences have been held at 2-year intervals. This volume is the record of the papers and discussions of the Eighth Biennial Wilderness Conference held in 1963.

Each of the more recent conferences has had a specific theme and these have included the relationship of wild lands to civilization, the value of wilderness to science, and wilderness as a part of American heritage. The eighth conference continued consideration of the meaning of wilderness to

us scientifically and culturally.

This book, along with those that recorded the three preceding conferences, gives a record of what might be called the wilderness movement. There is no better history of the crusade to preserve the natural beauty of the wilderness than is contained in these four books. They present the views and evaluations of a great number of competent participants.—LAWRENCE V. COMPTON, *Head Biologist, SCS.*

**APPROVED PRACTICES IN SOIL CONSERVATION.** By Albert B. Foster. 1964. *Interstate Printers and Publishers, Inc., Danville, Ill.* 384 pp., illus. \$4.65.

The third edition of this practical handbook of soil conservation techniques is slightly enlarged to include significant new practices adjusted to modern farming.



The principal addition is a chapter on "Minimum Tillage" covering such practices as mulch tillage, the plow-plant method of planting corn, and crop residue management for erosion control.

The subject of crop rotations is broadened to treat "cropping systems" that conserve soil and water. The chapter on terracing includes new information on parallel terraces.

This is primarily a "how-to-do-it" book, but the underlying prin-

ciples of sound land use and conservation are kept before the user.

—B.O.

## New Publication

**Conserving Our Natural Resources.** May 1964. *USDA PA-614. 42 pp., illus.* A guide dealing with natural resources and their interrelationships, prepared by Federal Extension Service, Forest Service, and Soil Conservation Service in cooperation with the Fish and Wildlife Service.

# School Forest Provides Income and Teaching Area

By **Don L. Richardson**

*Area Conservationist, SCS, Tallulah, La.*

**A**SCHOOL forest that will be a memorial to the far-sighted vision of members of the Continental Congress of the United States is being established by the Madison Parish School Board at Tallulah, La.

Through planting and selective cutting, a hardwood forest will eventually cover the "16th section" of land deeded to the school by the Continental Congress. The East Carroll-Madison Soil Conservation District is channeling technical and other assistance available from public agencies and private organizations to assist the school board in its forestry project.

Besides memorializing the Continental Congress, the forest will provide substantial annual returns to the school board treasury from the sale of woodland products. The board has already realized \$15,000 from the sale of low quality trees removed in an improvement cutting.

## School Land Policy

On May 20, 1785, the Continental Congress passed an ordinance for disposing of land in the western

territory. That ordinance was the beginning of the land system of the United States that provided for the establishment of townships 6 miles square, each of which would be divided into 36 sections 1 mile square.

The act provided that section No. 16 of every township should be reserved for the maintenance of public schools within the township. This 16th section subsequently became known as the school section. The income from this land was to be an important support for the broad policy of popular education in the United States.

## District Agreement

It was on this school land section that the Madison Parish School Board signed an agreement with the East Carroll-Madison district in December 1959 to develop the 16th section as a school forest. Besides this 640 acres, the school board owns 425 acres of partially open land. This had been used in the past as rented crop and grazing land, but neither tract had returned much financially.

The board had decided in 1958

to develop these two tracts as a financial investment with considerable potential and for the purpose of promoting a better appreciation and understanding of the hardwood resources of the Delta. A committee made a study of the proposed project and reported it highly desirable.

The East Carroll-Madison district developed a woodland conservation plan for the two tracts. The 16th section has been divided into compartments of 160 acres each by a system of roads, which also serve as fire lanes. Girdling of culls is planned to allow the reproduction of desirable species of trees. After this operation has been completed each compartment will be set up on a 12-year cutting cycle.

On the 425-acre tract of open land, 143 acres has been planted as follows: 26 acres cherrybark oak, 26 acres sweetgum, 3 acres sycamore, and 88 acres cottonwood. This area will be used as an observation plot. All costs will be recorded and will be used as an indicator for future plantings of this kind.

The 143 acres that were planted were put in the soil bank for 10 years.

## Conservation Plan

In developing the plan, the district was assisted by the Soil Conservation Service, Louisiana Forestry Commission, U. S. Forest Service, Extension Service, International Paper Company, Chicago Mill and Lumber Company, and the Deltic Land and Timber Company.

The school board anticipates that the school forest will serve still another purpose. It will be available to forestry classes in any Louisiana college or university that wants to use it for hardwood studies. The vocational agriculture teacher at Tallulah is already using the forest as a demonstration in planting and improvement cutting for his vo-ag students.



From the Administrator:

## ↓ *Woodlands in the Conservation Program*

**F**OREST conservation was one of our earliest efforts in conservation and development of natural resources. Even before Hugh Bennett had begun to attract recruits in his soil conservation crusade, such conservation pioneers as Theodore Roosevelt and Gifford Pinchot were establishing the National Forests and the Forest Service to administer them.

Within the past 30 years there has developed an appreciation of trees as a crop—both in their own right and for soil and water conservation—on the farms and other private land of the Nation.

By determining land capability for tree production, by planting thinning, and harvesting, and by applying other woodland-benefiting practices to the land, soil conservation districts have made real strides in perfecting everyday woodland conservation and management techniques.

These are practices that woodland owners and operators can put to use. Soil conservation districts, with their educational and technical aids, have been a potent factor in this progressive program of resource conservation. The districts can, and I think they will, play a vital role in making American Forestry Association's Conservation Program for American Forestry a reality.

I should like to emphasize that the woodland job on private land in the districts is being accomplished primarily through private resources with limited public assistance. Soil Conservation Service staffs assigned to soil conservation districts are available to provide assistance on woodland aspects of conservation farm plan development.

The conservation job on each farm, however, is the responsibility of land owners and operators them-

selves. The Soil Conservation Service part of this partnership is to provide, at the district's request, the trained technicians for making soil surveys, preparing conservation farm plans, and giving necessary onsite assistance in the application of planned practices on cropland, grassland, woodland, wildlife, and recreation land.

The SCS is concerned with people, with land, with water, and with the efficient use of these resources to produce crops and services that will make farms profitable on a continuing basis. The Service recognizes that trees are one of those crops, and encourages the planting and protection of trees where the land capability makes them the most suitable use for sustained productivity.

Obviously, the land owner or operator is the key to woodland conservation. Adoption of a conservation plan is a matter of the farmer's own decision in any case. It is his land and his pocketbook that are involved. The importance of this primary responsibility of the farmer on the woodland aspects of the conservation job is brought home by the fact that of the 508 million acres of commercial forest land in the United States, more than 366 million acres is in private ownership and more than four-fifths of that, or 300 million acres, is owned by more than 4¼ million people, 95 percent of whom are in soil conservation districts. Farmers, incidentally, own a larger percentage of our woodlands than does any other group—industry or government.

Altogether, 80 to 85 percent of the private owners have woodland which could be made more productive and more profitable if better management were applied. In soil conservation districts, much of the land owned by farmers is in woods.

Some of the land now being cultivated or used for other purposes could be converted to tree production or recreation as its safest and most profitable use. The integrated use of these woodlands with land in other uses is essential to an effective soil and water conservation program.

The Soil Conservation Service is an agency dealing with soil and water conservation problems across the board on the Nation's farms and watersheds. We think of our sister agency, the U. S. Forest Service, as the manager of our vast system of National Forests. We also look to them for most of the forestry research which provides the technical information to be applied in woodland conservation and management. Through them the State Foresters receive financial assistance for forest management work. Our policy is to encourage use of our joint resources in helping landowners to improve their woodlands. In doing this we collaborate with State Foresters, State, county, and local units of government, conservation organizations, associations, private industry, consulting foresters, and others.

We work with a substantial number of landowners who cannot or do not wish to do all of their woodland conservation jobs themselves. We encourage them to use the services of private professional foresters or of State forestry departments. We want landowners to have the best possible guidance in using woodland conservation practices along with other needed soil and water conservation practices.

In this way, we think the Nation will make the most rapid progress in applying the Conservation Program for American Forestry.—D. A. WILLIAMS.



If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

## Planted Pines Are Major Crop on Plantation

More than 10,000 acres in planted pines are included in the Sunnyhill Plantation, a cooperator with the Kershaw Soil Conservation District, near Camden, S. C. The

plantation is part of the estate of the late C. M. Leonard, one of South Carolina's pioneers in the reforestation program.

S. Tetterton was resident for-

ester at the plantation for 16 years. SCS provided technical assistance on the conservation plan through Work Unit Conservationist V. T. Mullen.





Reserve  
1.6  
So 3 S

# Soil Conservation

NOVEMBER 1964  
VOL. XXX NO. 4

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY  
OCT 29 1964  
CONSERVATION DIVISION

## NATURE CONSERVATION

*In a Watershed*  
Page 75

*On a Strip Mine*  
Page 77

## —AND EDUCATION

*Ghost Ranch*  
Page 78

*Scout Jamboree*  
Page 84

*At School*  
Page 82

SOIL  
CONSERVATION  
SERVICE

U. S. DEPARTMENT  
OF AGRICULTURE





# Soil Conservation

## *Naturally . . .*

When we spread the word that *Soil Conservation* would feature conservation that preserves naturalness of landscape and abundance of wildlife for enjoyment and study, we hoped for two or three contributed articles that would effectively emphasize the theme.

The response surely will please Audubonites and others who make this their special concern. Manuscripts from SCS fieldmen not only would (and do, almost) fill this issue to the exclusion of all else, but another of equal size.

We think this must be a measure of the extent of nature conservation naturally resulting from soil and water conservation.

These are not mere exhortations to practice conservation; they are real examples of conservation practiced—on a watershed (p. 75), a strip-mine (p. 77), and many others.

You will see more of them later.

**To Know Is to Care:** Young people—and adults—who see, touch, and hear the living world around them become alert guardians of what they cherish. Natural areas and materials let them know their heritage, as at Ghost Ranch Museum (p. 78), Scout Jamboree (p. 84), and a school (p. 82).

**Cover Picture:** A wildlife trail leads a family into Brookfield Park, a recreation development in Northern Virginia Soil Conservation District.



## CONTENTS

- 75 Watershed Wildlife**  
Ischua Creek shows how to provide habitat  
*By Robert E. Myers and Homer E. Stennett*
- 77 Spoilbanks and Birdlife**  
Birds come back with vegetation to Avondale  
*By H. Granville Smith*
- 78 Ghost Ranch Museum**  
Natural areas, conservation exhibits are living textbook
- 82 Outdoor Laboratory Builds Interest in All Studies**  
*By Erling W. Clausen*
- 84 Conservation, Your Community, and You**  
Scout Jamboree theme told to 50,000 boys
- 87 Quality in Outdoor Recreation**  
*By Frank C. Edminster*
- 88 How to Attract Birds and Other Wildlife**  
*By Roy A. Grizzell and Verne E. Davison*
- 90 Gravity Flow Sprinkler System for Foothill Irrigation**
- 92 Natural History Societies**  
National Audubon Society serves growing interest  
*By John Vosburgh*  
Regional, local groups have diverse programs  
*By Shirley A. Briggs*
- 94 New Publications**
- 95 From the Administrator**  
Civil Rights Act; Rural Beauty

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

BEN O. OSBORN  
Editor

GEORGIE A. KELLER  
Editorial Assistant

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Prints of photos can be obtained on request.

**Subscriptions:** Price \$1.50 per year, \$2.50 foreign. Single copy, 15 cents. A discount of 25 percent will be allowed on orders of 100 or more sent to the same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.



# Watershed Wildlife



A pond and an odd area planting of multiflora rose, tartarian honeysuckle, autumn olive, and conifers provide wildlife habitat elements formerly missing in this open field on Fred Jentsch's farm.

Ischua Creek  
shows how  
local people  
can provide  
widespread  
habitat

By Robert E. Myers and  
Homer E. Stennett

*Wildlife Biologist, Syracuse, and Work  
Unit Conservationist, SCS, Jamestown,  
N. Y.*

**F**LOOD prevention dams and conservation land treatment on upstream areas normally provide both direct and indirect benefits to wildlife in small watershed projects under Public Law 566.

The project work plan can go much further, however, to provide specific improvements in habitat for both land- and water-dwelling species where the local people desire and interested organizations cooperate.

The 75,000-acre Ischua Creek watershed in southwestern New York is an example of how residents of a watershed can take advantage of the many opportunities for recreation and wildlife devel-

opment in a project.

Incorporated into the designs for two of the flood prevention dams are provisions for large permanent lakes. A 35-acre trout-fishing lake and an 80-acre lake for boating and other recreation developments are being cost-shared by the New York State Conservation Department.

All of these developments are only an hour's drive from the Buffalo-Rochester urban complex of 2 million people. It is expected that these people will use the developments to capacity.

Not all the recreationists, however, will be looking for a place to picnic, swim, or fish. Many will

come just to enjoy the quietness and beauty surrounding a lake nestled in a cool, wooded valley. Cameras will click and binoculars will search this new habitat for the wildlife attracted by the water.

There are plans for a 250-acre marsh that will attract herons, gallinules, and other marsh dwellers not so common around a lake.

Areas like these with their adjacent upland fields and woodlands present an opportunity for the local Audubon Society and other nature organizations to develop nature study areas with trails and information centers. These same sanctuaries can be used to good advantage by schools for outdoor



classrooms as part of their science programs.

Similar aquatic habitats will be created throughout the watershed by the farm ponds constructed for livestock or irrigation water, recreation, or fire protection. Already there are 74 ponds in Ischua Creek watershed, and plans call for at least 40 more. Some of them are stocked with fish, and 95 more are planned to be stocked.

A recent study by one of the authors revealed that an average of a third of all the farm ponds built through the soil and water conservation district programs are used for some form of nature study by members and friends of the owner's family.

Recently, a study group from the State University of New York at Buffalo made an extensive study of aquatic insects in one of the watershed ponds. They found larvae or adults of 19 aquatic insects such as dragonflies, water skippers, and water boatmen.

Ischua Creek is a fine brown trout stream, and on the main stream several flood-prevention structures have design features of interest to fishermen. It was recognized that a typical flood prevention dam with a shallow sediment pool could interfere with the upstream movement of trout and tend to warm the water. As a result, to keep the water cool, one of the major dams is designed with a pipe at stream level and without a sediment pool.

### Home for Trout

The Ischua Creek plan calls for 21,000 feet of streambank protection and exclusion of livestock from 500 acres of critical areas. Fences will keep cattle from the banks except for a few gently sloping areas reserved for stream crossing. The raw banks are then shaped and seeded to grasses, legumes, and shrubs, or allowed to seed naturally. The vegetated banks provide food and cover for many kinds of wildlife, and the

shade keeps the water cool.

More than 5 miles of trout stream improvement is planned and half has been completed by the State. This includes log V-dams and timber crib bank protection to provide pools and cover for trout.

In addition to the dams and stream improvements, the land treatment in the watershed is of great significance to all forms of wildlife. The varying combinations of soil and water conservation practices bring the necessary habitat elements of food, cover, and water together throughout the landscape. These conditions favor variety and abundance of wildlife.

### Farmland Habitat

On cropland, contour stripcropping and rotations benefit wildlife most. Under a rotation of corn, oats, and hay in strips across the slope, the oats and corn are bordered on both sides by hay. Each field then includes wildlife foods along with nesting cover. Other habitat elements are supplied in odd areas, hedgerows, and woodlands.

Wildlife habitat development on odd areas can be planned to provide otherwise missing habitat elements. In Ischua Creek watershed, district cooperators already have developed 377 acres of habitat, and they are planning another 200 acres. On these areas farmers plant grasses, legumes, shrubs, or conifers as needed, or manipulate existing plants. Plans also call for 32,000 feet of hedgerows of shrubs and conifers.

Once the desired habitat is established, it must be maintained, otherwise through natural succession the area will become overgrown and the wildlife will be replaced by other species. Rotary brush cutters, chemical sprays, controlled burning, and grazing are used to control vegetation.

Pasture and hayland planting and renovation improve the quality of grassland for both livestock and wildlife. Pastures managed to prevent livestock from killing

out the vegetation provide better nesting cover and food for the wildlife.

Woodlands that are kept in proper balance by harvest cutting, thinning, and weeding are most productive of wildlife. Exclusion of livestock permits young trees to grow to produce quality timber and provide browse, mast, and homes for wildlife.

### A Farm Restored

As in many other parts of the country, many nonresidents have purchased farms in Ischua Creek watershed to develop them entirely for wildlife and recreation.

About 12 years ago, Fred Jentsch of Buffalo, bought such a farm and began his improvements following a conservation plan made with the help of the Soil Conservation Service.

The new owner kept an old orchard, a woodlot, and several brushy areas in their natural condition. He planted conifers and food plants where needed to diversify the habitat.

Five ponds and three marshes were built to provide water in the upland areas for wildlife and waterfowl and fishing and recreation for the family. He planted trefoil and timothy on wide trail-like strips throughout the farm. These are mowed periodically to maintain the open grassland condition. Now the once depleted farm is a delightful place for anyone who loves the outdoors.

Twenty-five years ago, the only good hunting in the Ischua Creek watershed was for deer. Today there is good hunting for grouse, rabbits, turkey, and waterfowl as well. Songbirds also have increased and new species are seen in areas where they had been lacking. The great blue heron has become a common sight around the farm ponds.

The completed Ischua Creek Watershed project is sure to produce an outstanding wildlife, nature, and conservation area.



# Spoilbanks and Birdlife

## Birds come back to Avondale with recovery of vegetation on reclaimed strip mines

By H. Granville Smith

Field Biologist, SCS, Columbus, Ohio

**T**HE songbirds are coming back to Avondale, a reclaimed strip-mine spoil area in eastern Ohio.

The 3,500-acre Avondale area in southern Muskingum County is one of several large strip-mining areas owned by the Ohio Power Company. Coal from these areas is used to produce electricity for a large part of Ohio.

Strip-mining, of course, destroys the vegetation and therefore eliminates the wildlife. Luckily for the songbirds, though, Ohio Power Company doesn't leave the spoil areas "spoiled." The company has been a cooperator with the Muskingum Soil and Water Conservation District since 1946.

The company's conservation plan calls for replanting the spoil banks created in each year's mining operations. The tree planting mixture is one-third black locust; one-third soft hardwoods, such as tulip-poplar, sycamore, wild cherry, sweetgum, and red maple; and one-third climax hardwoods, such as oaks and sugar maple. Some volunteer trees have come into the stand, as well as some grasses, legumes, forbs, and shrubs.

About 25 percent of the land in the Avondale mine area has been strip-mined and planted. The unmined areas contained some woodlands, some brushy areas, and some open fields. Most of the open areas have been planted to red, white, and shortleaf pines.

To find out what this reclamation project was doing for the bird life, I made a field study on five selected areas. Four times—in December, April, May, and June

—I walked a half-mile route in each area and counted the birds within 200 feet of the routes. In June, I made a nesting census.

Here are the results:

Area	Species	No.
3-5-year-old reclaimed	19	78
3-5-year-old unmined	39	287
18-year-old reclaimed	33	158
18-year-old unmined	39	215
Farm fence row	47	282

The fence-row and farmland habitat adjacent to the Avondale mine area contained the most species, probably because it provided the most diverse cover—a combination of pastureland, meadowland, cropland, farm woodland, and a  $\frac{1}{4}$ -acre marsh. The fence row itself was composed of 50-foot-tall trees and some brushy cover for about half of its length. The other half was open.

The June study showed that 11 species nested in the 3- to 5-year-old reclaimed area and 19 species in the 3- to 5-year-old unmined area. Among them were field

sparrow, redwinged blackbird, indigo bunting, rufous-sided towhee, song sparrow, redeyed vireo, yellowthroat, and indigo bunting. A total of 25 species nested in the 18-year-old unmined areas, and 32 species in the farm fence row.

Green heron, redtailed hawk, and sparrow hawk were seen in the older reclaimed area in June. Their presence indicates that normal predator-prey relationships are now being established.

Flickers, hairy woodpeckers, and downy woodpeckers also were seen in the area. They perhaps were attracted by the presence of locust borers in the black locust trees.

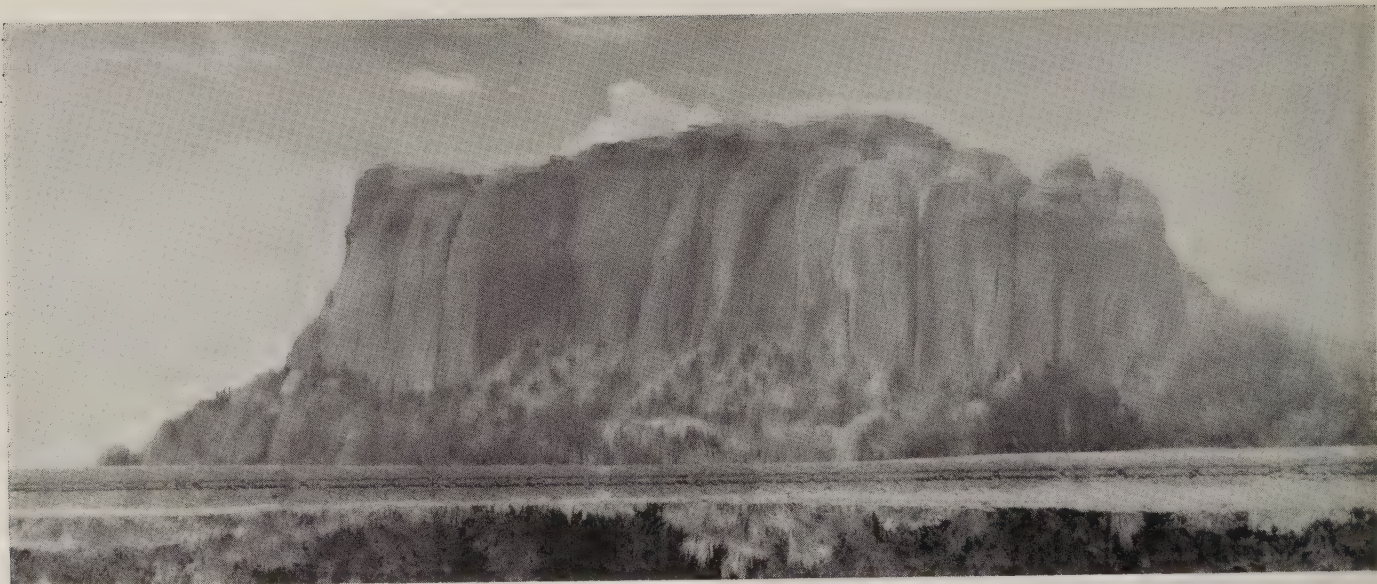
Presence of roughwinged swallow and purple martin indicates that aquatic insects are being produced in the strip-mined ponds.

The Avondale story is being repeated in other areas of the Nation as conservation planning reclaims many acres of land that was disturbed during strip-mining operations. As vegetation develops, including valuable timber, a substantial wildlife population establishes itself. These wildlife and forest resources can provide needed recreation opportunities in addition to beautifying the land and protecting it from erosion. In another area owned by the company, camping sites are being installed for use by campers and fishermen.



Birds are already nesting in this strip-mine area, 3 years after planting on the left of the road and 5 years on the right.





*Legends of yesteryear, hopes of tomorrow . . .*

## Ghost Ranch Museum

**Natural areas, conservation exhibits  
are living textbook of the land**

**A**BOUT 60 miles northwest of Santa Fe a highway sign draws attention to a picturesque 21,000-acre ranch-spread whose origins, the tourist learns, can be traced to Charles III of Spain.

It is "El Rancho de los Brujos"—The Ranch of the Witches.

Once an object of superstition and fear, the setting of range fights, and an area shunned by even the weariest traveler, the ranch is today an oasis for vacationers, a lesson in conservation, and a national conference center for Presbyterians and the site of the Ghost Ranch Museum.

Before the visitor a panorama of soil and water conservation unfolds, a monument to the vision and effort of men of the Charles Lathrop Pack Foundation, builders and operators of the museum, and others of Federal, State, and local organizations who helped them.

Soil Conservation Service technicians and supervisors of the Coyote-Canones Soil and Water

Conservation District lent an early hand, helping to plan and install range condition plots and grass trials, earth construction, and other conservation examples.

Near the highway entrance is part of the work, a 10-acre display of the needs and treatments involved in the conservation job. The SCS shared the costs of this dramatic show.

The museum with its outdoor exhibits and trails is a walk through the ages, a picture window of a geologic past, and a vision of land use and conservation to come.

### "Vivaron" Lives On

Legend has it that the first settlers in the canyons lived in terror at reports of a monster called the "vivaron"—a rattlesnake-type creature, according to the telling, about 30 feet long. Cowboys and sheepherders reported seeing it in the badlands not half a mile from headquarters.

Over the years the legend per-

sisted as the land changed hands. Once the title, in a card game, went to a cowboy and his eastern bride who operated their new property as a dude ranch. Later the ranch was the site of a Civilian Conservation Corps camp and operated again as a real cow outfit, this time complete with a soil conservation management plan and agreement with the Coyote-Canones district.

The story of the "vivaron" gained credence when a group of university paleontologists discovered—in the same area where the "vivaron" once had been "seen"—the skeleton of a phytosaur coiled and giving the hint of movement as the bones gave off heat waves in the sun. The skeleton was excavated and displayed in the American Museum of Natural History in New York.

Today the fossils of millions of years ago are housed in the Ghost Ranch Museum building, near the place of their discovery. In the



North of Ghost Ranch headquarters hovers Huerfano mesa, "the Orphan," a remnant of the area's geologic past, a breath-taking backdrop for the conservation scene (opposite).

Here visitors to Ghost Ranch leave their automobiles and walk a path leading to unforgettable glimpses of the works of nature.

room are recessed cages of live kangaroo rats, tarantulas, turtles, lizards, snakes, and other examples of native wildlife. Outside, a circle of "natural" cages houses bigger species including the wildcat, cougar, bear, and fox. Beyond are the ecology exhibits, natural areas, trail sites, and the story of nature that can only be properly told in the out-of-doors.

According to Arthur N. Pack, chief executive of the Pack Foundation, Ghost Ranch provides a view into one of the most unusual areas in an unusual State.

"It is a focal point—a borderline between the legends that stretch back through centuries and the hopes that reach into the far years ahead," Pack says.

Pack and his wife acquired the ranch in 1935 and dedicated it 20 years later "to perpetual good use in the Christian cause." They



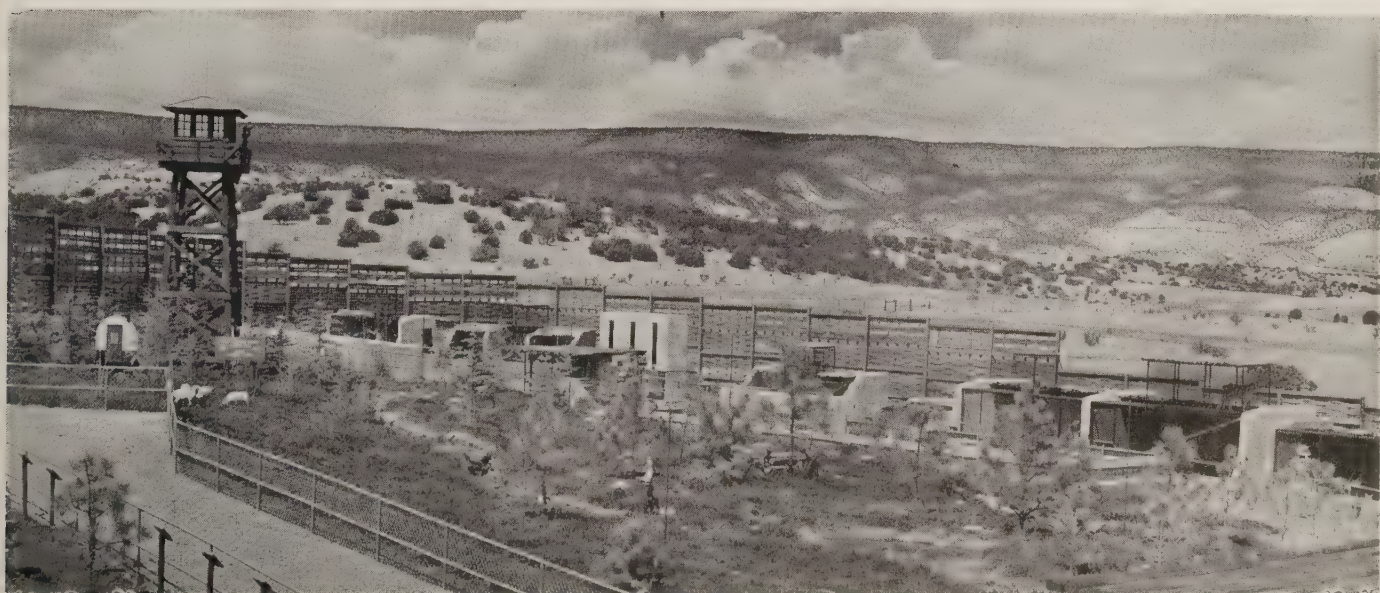
helped establish the church conference and broke ground for the interpretive nature center in April 1959. The Packs were visited by nearly 4,000 persons that summer, folks who just wanted to see what was going on.

### "During Construction"

Attendance has grown in spite of signs which say: "Open for your enjoyment during construction." The signs will remain because in Pack's thinking the teaching job will never be finished. Each year will bring changes, new exhibits, and improvements.

In 1964, 90,000 visitors stopped before the Labor Day weekend to look and learn. No one paid admission, but many gave generously to help carry on the work.

William H. Carr, director of the center and the man who conceived many of the living museum's installations, says building an appreciation of nature and explaining its meanings develops a "will to care" among good citizens. The aim at Ghost Ranch is to show that contrary natures, geographic and human, can be harnessed to restore land to its original usefulness and beauty.



In the enclosure visitors see the trees and other plants that, combined with other values, make a forest useful and attractive. Beyond are the animal displays and, still farther, the pinyon-juniper slopes.



Carr brings long experience in conservation teaching to the ranch. He spent over 40 years in the profession. He was nationally acclaimed for his work at the Arizona-Sonora Desert Museum in Tucson and at other centers including the Bear Mountain Trailside Museum in New York.

### Selling Conservation

According to Carr, the museum is a "neon-sign" to gain attention. "What we are selling is conservation. We show animals and use exhibits as attention getters to tell the story of nature and to encourage people to take care of what nature has given them," he explains.

On the "Walk Through the Ages" visitors use mounted telescopes to see geologic times reflected in the distant 1,000-foot sandstone cliffs. They touch nearby samples of the rocks, read clever signs, and listen to explanations over public address systems. Questions are rewarded by direct answers from trained staff members.

Here an exhibit shows erosion in action with push-button rain falling on various kinds of terrain. Another reveals how the land once was, how man has helped cause deterioration, and how it might be reclaimed through conservation practices. There is a model forest of several acres, complete with campers, lumberjacks, and fire control on a half-life-size scale. There are grass study plots and a walled prairiedog town. A "Talking Beaver" relates his conservation role in Spanish and English.

More than 50 schools within 125 miles send children to see the exhibits and supplement their classroom learning. Many students return with their parents. Each year the number of participating schools grows.

The arroyo work—control of the big gullies—is one of the most graphic of the demonstrations. Mounted telescopes are trained on distinctive soils, plants, erosion,



At this range site and condition plot installed by the SCS and conservation district, visitors may view the plants and conditions that have important meanings for the livestockman and others concerned with the conservation of nature's resources.

and control features. Soil monoliths, the work of SCS and New Mexico State University soils experts, are glass-cased. Speaker systems explain problems and solutions at the visitor's touch.

All this is part of a growing watershed demonstration which will eventually show peak-to-river sequence beginning with the forest and followed by the upland range, irrigated lands, dams, multiple-use areas, and the many other facets of conservation practice. Half-size farm and ranch improvements and equipment will complement the area.

### Watershed Demonstration

Under the ramada—a shelter for about 50 people at a time—a scale model is planned of the Santa Cruz Watershed project being developed with the aid of Public

Law 566. This will help visitors visualize the actual watershed they see in the conservation area's telescopes.

Each year the Ghost Ranch Museum comes nearer being "the living textbook whose purpose is to teach a lesson in the ecology of the Southwest,"—to use Arthur Pack's words.

Beyond the museum and nature center complex, conservation takes on broader meaning on the ranch itself. One of these is the development - management - improvement job necessary to the modern operation of a 22,000-acre ranch where rainfall averages as little as 10 inches annually.

Grassland management on five principal range sites is of paramount importance. Structures are needed to counter past mistakes and to prepare for the future.



Debris basins, irrigation of supplemental hay fields, range pitting, evergreen tree plantations, land leveling, reseeding, and crop and livestock adjustments are all part of the conservation plan signed by the Church Board of Christian Education and the Coyote-Canones district and being put into effect by the ranch manager. Success of the work is indicated by an advance of at least one condition class in many range areas.

The ranch improvements, demonstration programs, and attraction of tourists and students all dovetail into the Resource Conservation and Development Project proposals of Rio Arriba County and adjoining areas.

### Throughout the Nation

The influence of the conservation work on the ranch is extended throughout the Nation through the educational efforts at the conference center.

Dormitories and cottages there accommodate more than 5,000 guests each year from all parts of the country. While most visitors are church-affiliated, many others use and enjoy the facilities. Among them are participants at soil and water conservation district zone meetings, technical workshops, and scientific society gatherings. Several tours scheduled in advance of Soil Stewardship observances have joined resource conservationists and church leaders.

Youngsters at the summer camp programs are housed in a "Tepee Village" and true Navajo hogans alongside the Arroyo del Yeso. The old ranch bunkhouse, saddle rooms, and the Cottonwood Adobe provide up to 285 visitors at a time with a touch of yesterday and a respite from a busy world.

Nearby, the Spanish-styled Ghost House, now 135 years old, stands as a reminder of the first settlers to call this beautiful valley home.

Those who visit Ghost Ranch scatter to their homes, churches, and communities thousands of

miles apart, taking with them memories of the grandeur of the terrain, the charm of the historic valley communities, and a new sense of the gifts of nature.

Vacationers, travelers, church

people, scientists, and school leaders write back to say the enriching experience of their visit was added to immeasurably by the efforts of Arthur Pack and William Carr and "A Walk Through the Ages."

## New Award Program Supports 4-H Club Conservation Project

A new national 4-H Club program in conservation of natural resources offers county, State, and national incentive awards to 4-H members who excel in the project.

The awards will be administered by the Cooperative Extension Service through the National 4-H Service Committee. They will consist of six college scholarships of \$500 each, a trip to the National 4-H Club Congress for the winner in each State, and four medals of honor in each county.

"Effective conservation will be attained only as our people appreciate its importance and develop an understanding of effective and practical conservation measures," said Lloyd H. Davis, administrator of the Federal Extension Service, in announcing the awards. "Herein lies an opportunity for 4-H leaders to make a significant contribution, not only to youth through assisting and guiding their training, but also to the longtime welfare of the Nation."

The new 4-H program will be based on the recently published 4-H Leader's Guide, "Conserving Our Natural Resources," which was prepared cooperatively by the Federal Extension Service, Soil Conservation Service, Forest Service, and Fish and Wildlife Service.

This publication provides for the first time on a national scale a comprehensive guide dealing with conservation of our natural resources and their interrelationships. Regardless of whether the

4-H boy or girl's natural interest is in soil, water, grasslands, forests, or wildlife, the guide provides information enabling the user to relate each resource to all the others.—E. J. WILLIAMSON, *Extension Soil and Water Conservationist, Washington, D. C.*

## Study Area Wins SCSA Merit Award

The West Arapahoe Soil Conservation District of Colorado received the 1964 Merit Award of the Soil Conservation Society of America and earlier the Merit Plaque of the American Association of Conservation Information for obtaining 2,000 acres of prairie land and establishing the Plains Conservation Center.

This natural study and exhibit site is within hiking distance of metropolitan Denver and only minutes away from schools and suburban developments. Plans for the center were drawn up by more than 300 individuals and committees representing both urban and rural interests.

The National Audubon Society, the Soil Conservation Service, and Colorado State University provided planning assistance. Membership drives to encompass the entire State are timed for late 1964 with an outdoor conservation education program aimed at the area's 225,000 schoolage youngsters beginning early in 1965.





Kindergarten pupils study a box turtle near the "central Jersey stream," part of the school's outdoor lab.

## Outdoor Laboratory Builds Interest in All Studies

By Erling W. Clausen

*Superintendent of Schools, Freehold, N. J.*

**N**ATURAL areas are becoming an accepted part of school life in the United States.

Because they stimulate interest not only in the sciences but in all studies, because they engender fresh enthusiasm among students and teachers, many school boards include natural areas in their plans for new buildings. That means that certain parts of the school's grounds are set aside and kept intact, out of the path of bulldozers.

The natural areas then become an actual part of the school—an outdoor laboratory in which the students can see, feel, hear, smell, and even taste what they study in the classroom. The advantages of such a laboratory are obvious.

But many if not most of existing schools were built before the value of natural areas to students and faculty had become evident. Some school boards have tried to overcome this deficiency by acquiring tracts of land in their natural state. Generally these tracts have

the disadvantage of being miles from the school. Use of them usually amounts to no more than a quick tour. To render its fullest value, a natural area must be part of the school grounds so that it can be used quickly, easily, and at will by students and teachers.

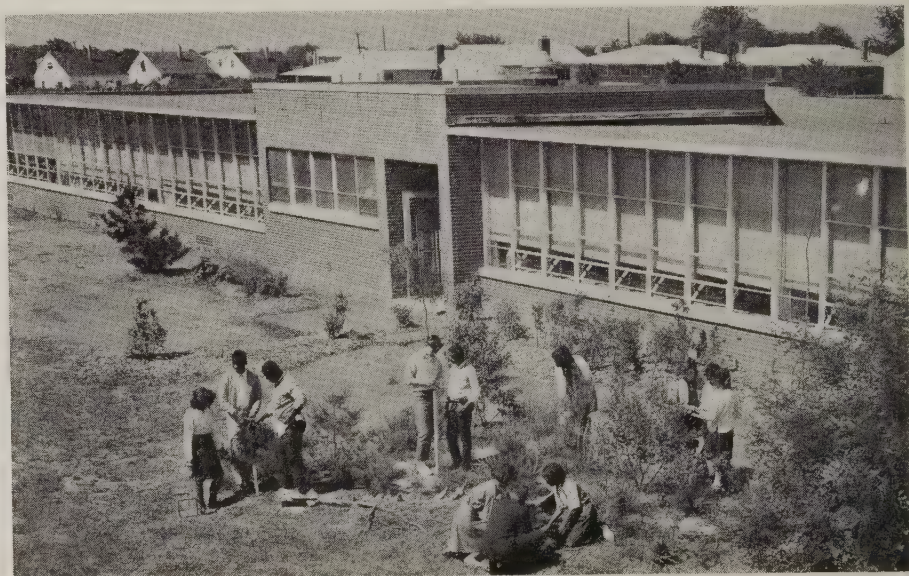
### Manmade Study Area

Does this mean, then, that nothing can be done for schools that were built without preserving part of the grounds as a natural area? No, I don't believe so. The handicap can be overcome by establishing an artificial, manmade "natural" area. It can serve almost as well as a genuine natural area.

That has been our experience at the Intermediate School in Freehold, N. J. We have established a miniature, simulated "natural" area that has proved so successful a part of our teaching process that we are planning to enlarge its scope—by degrees.

Naturally enough, the idea for our outdoor lab came from Neal Munch, a professional and dedicated work unit conservationist for the Soil Conservation Service in the Freehold Soil Conservation

Eighth grade students identifying plants, checking rain gage, and measuring tree growth in the "pine barrens of south Jersey" part of the outdoor laboratory.





District. At the time, he was a member of the school board, later its president. In blueprinting the outdoor lab, he had the help of Marvin A. Clark, Monmouth County agricultural agent, and Raymond Korbobo, extension specialist in landscape design at Rutgers University. The New Jersey Division of Fish and Game has also been an interested helper in the development of our outdoor lab from the beginning.

The planners set up the outdoor lab between two wings of the school building. A high wire fence protects the area at the open end.

### Resource Areas Shown

An advantage of our manmade "natural" area is that it represents various land resource sections of the whole State. The actual soil and vegetation were brought from their natural areas. In carrying out this chore, on his own time and after school hours, Mr. Munch was assisted by some of our older students and Harold G. Smith, our 8th grade science teacher.

Begun in 1962 before I became school superintendent, our outdoor lab now consists of miniature reproductions of several New Jersey land resource areas, 200 different plants, 28 types of animal life, and 2 ponds.

From kindergarten to 8th grade, students have the opportunity to observe turtles, frogs, rabbits, fish, water and land insects, and microscopic life. Other objects of study are the many birds attracted to the area by feeders and houses built in the school shop for their use.

### Firsthand Knowledge

"Without the outdoor lab," Mr. Smith points out, "the students could obtain their knowledge only from books and similar material. That's not enough. With only book knowledge, a student could get lost, literally and figuratively, in a genuine natural area. Here it's just a step to our outdoor lab where



Gail Furniss, 8th grade, examines a robin's nest in a red cedar tree in the "central Jersey" section of the outdoor lab.

the students can learn things first hand, or confirm what they have read or heard in the classroom. An outdoor lab has a tremendous potential as a teaching tool. Ours will be used to an increasing degree as we enlarge its scope."

In the outdoor lab, our students learn about the relationship of plants and animals to their environment. The conservation of natural resources is an important part of the general study. Specific subjects include the study of plants, such as the identification of flowers, shrubs, and trees, and of insect damage to plants. Long-range projects include the study of erosion and the rate at which plants grow. Observing erosion at close range, the students can then understand how rain falling on

bare land can wash priceless topsoil from unprotected yards and farm fields into reservoirs, streams, and harbors.

It took only about \$500 cash outlay to establish the outdoor lab. The \$300 fence was the largest item. Sand cost about \$25 and plants about \$30. Most of the sand and many of the plants, however, were obtained free for the digging.



Moisture in depths down to 4 feet should be considered in planning fertilizer rates for most soils.



Grassed waterways carry flood runoff safely from terraced and contour-cropped fields and from roadways and airports as well.



# Conservation, Your Community, and You

## Scout Jamboree theme told to 50,000 boys in multiple resource exhibit areas

**S**URROUNDED by an authentic setting of American history and heritage, Boy Scouts at the Sixth National Jamboree at Valley Forge July 17-23 saw how their future community life and welfare depend largely on conservation of all their natural resources.

Upwards of 52,000 Scouts, Explorers, and Scout leaders and

officials gathered at the historic 1777-78 Continental Army campsite for their once-every-4-year "Olympiad" celebration. They came from every State and 46 foreign countries and encamped on the 2,033-acre Valley Forge National Park near Philadelphia, Pa.

Three duplicate conservation

Historic Valley Forge Park became Pennsylvania's eighth largest population center during the Jamboree (below).

A cut in Valley Forge's hallowed soil (upper c.) helped William L. Perry, National Park Service, explain to the gathered Scouts the importance of conserving the thin layer that supports life.

A model of a small watershed (lower c.) illustrated how all resources are related in a community. Forester Paul H. B. Glenny, of Pennsylvania Game Commission, explains.







In the freshwater resources station (above), a series of rock and log structures showed how a flowing stream is made to behave for the benefit of fish and fishermen. This pool brings pleasant reflections to (l. to r.) J. K. Stern, national councilman, BSA, and Scoutmaster Mark Geeslin and Explorer Alan Dunlap of Jayton, Tex.

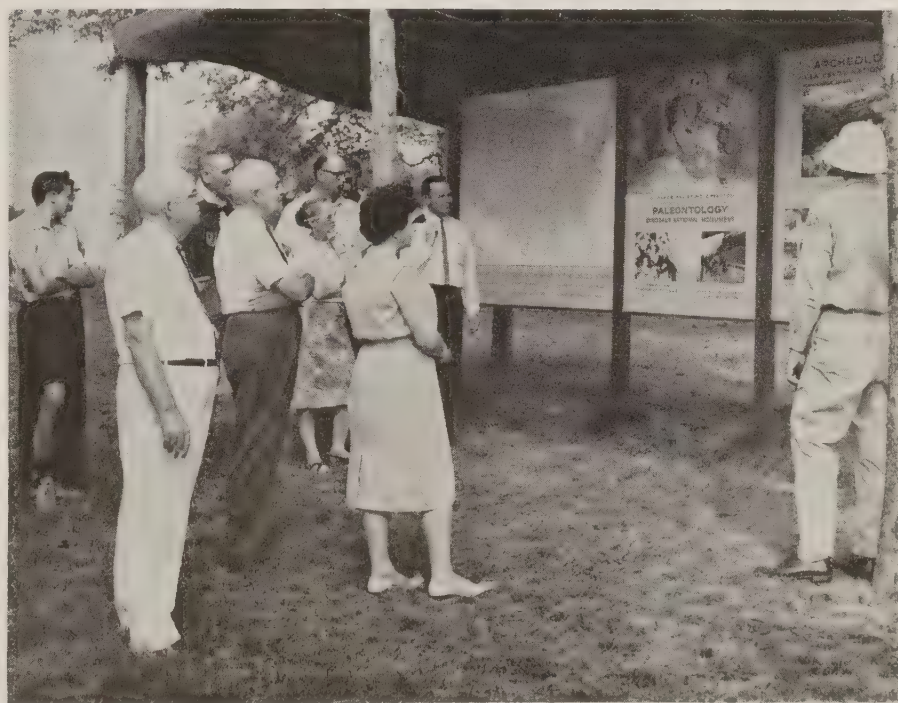
SCS Administrator D. A. Williams (l. foreground, below) with other conservation leaders reviewed the exhibits with approval.

...eas, geared to emphasize the  
...rowing demands being made on  
...r earthly resources in the midst  
...rapid space-age advancements,  
...ere constructed at the Jamboree  
...acquaint Scouts with the full  
...nge of resource management.

Each site had 10 demonstration  
...ations designed to graphically  
...lustrate how weather, geology,  
...il, fresh water and marine re-  
...ources, woods, grasslands, fish  
...nd wildlife, watershed protection,  
...nd backyard conservation were  
...l closely related to modern, pro-  
...ressive community life.

Several local, State, and Fed-  
...al agencies, including the Soil  
...nservation Service and Forest  
...ervice, combined their special  
...lents to make the unified Jam-  
...oree Conservation Shows.

Scout troops were given hour







Participants in the Jamboree represented many youth, education, and conservation organizations. Among them were (l. to r.) Wayne E. Maresch, SCS work unit conservationist, Lancaster, Pa.; Walter J. Wenzel, assistant, and Ted S. Pettit, director of conservation and camping, BSA; Robert M. Eisenberg, director of rural services, National Education Association; and Adrian C. Fox, educational relations specialist, SCS.

and a half guided tours through the conservation areas by specially trained technicians from the participating agencies. Two-man teams from New Jersey and Pennsylvania and a three-man team from New York represented the SCS as conservation guides. Adrian Fox of the SCS Information Division, Washington, D. C., assisted by Wayne Maresch, Work Unit Conservationist from Lancaster County, Pa., headed the SCS Jamboree task force.

Each man guided 2 or 3 groups of 40 to 80 Scouts a day through the conservation demonstrations. Nearly 3,000 Scouts toured each conservation site daily. The grand total visiting the combined show areas was more than 48,000, according to Ted S. Pettit, director of conservation, Boy Scouts of America, and Walter J. Wenzel, his assistant.

In this share-the-conservation program, SCS provided 2 of the 10 demonstration stations at each

site. One of these, the first stop on the conservation tour, was an exhibit on soils. Here, a 3- to 4-foot-deep walk-by soil profile pit was dug in the hallowed Valley Forge earth in each show area. This was used to show Scouts how the soil looked where they stood.

Augmenting this soil profile was a large panel with seven monolith soil profiles. Each of these showed exact profiles from Washington, New Mexico, Wisconsin, Nebraska, Georgia, and Vermont. A large map of the United States set above the monoliths helped locate the specific sites. Pointing to variations in these profiles, guides were able to show the Scouts how soil formation varies between deserts, prairies, and woodlands.

Further along the conservation tour was a 5 by 9-foot watershed model designed to illustrate how many American communities are solving flood problems and improving living conditions through watershed protection projects.

The models illustrated how up-land conservation measures, combined with well-planned flood-water-retarding dams and channel improvements, end flood threats, protect soil and water resources, and provide a community with municipal water supplies, fish and wildlife improvements, irrigation water, and recreation areas.

Here, as well as at other demonstration stops on the conservation tour, community conservation was emphasized.

As the week-long 1964 Jamboree ended most of the Scouts had passed through the conservation areas. By the thousands, they had seen and learned important facts about conservation of their community resources. They went home armed with knowledge of the need to arouse the interest of their friends and neighbors in community conservation projects.

And as their efforts—small or large—become a reality, Scout leaders and conservationists are sure that Valley Forge will have added another page to American history and helped strengthen our heritage.

## Biologists Sought In Outdoor Recreation

College graduates with training in biological sciences are in line for greater employment opportunities resulting from the upsurge in demand for outdoor recreation.

The Bureau of Outdoor Recreation estimates that by 1968 Federal and State agencies will hire about 50 percent more professional personnel to work in outdoor recreation jobs.

College graduates with biological science training will be in greater demand than any other group for employment in recreation with Federal and State agencies.

In 1963 Federal agencies reported 4,489 full-time professional employees and 38,933 employees whose duties included part-time outdoor recreation responsibilities.



# Quality in Outdoor Recreation

By Frank C. Edminster

Resource Development Division, SCS, Washington, D. C.

**Q**UALITY is an important watchword in outdoor recreation. The Soil Conservation Service, as a technical agency charged with guiding recreation development on private land, must build quality into the specifications for recreation facilities as it has into other land use measures.

Quality in the outdoor recreation *experience* is the object; quality in the *development* and *management* of outdoor recreation areas is the means of achievement.

Every American who has gone to the country seeking pleasure through the enjoyment of beauty, seeking healthful relaxation through outdoor activities, has experienced the disappointments of desecrated scenery, substandard facilities, and overdeveloped "recreation" areas.

Excesses of billboards; hillsides covered with rusting auto carcasses; honky-tonk roadside businesses with gaudy, flashing signs and noisy juke-boxes; rutted, muddy, or dusty morasses that make-do as auto parking areas—these are a few of the scars that mar our countryside.

## Naturalness First

*Naturalness* is a quality that should be sought first for rural areas, especially those with good scenic attributes.

Naturalness in this context does not mean untouched nature. It does mean unabused nature—a landscape without the scars of accelerated soil erosion, without the evident effects of poisons applied to vegetation. It means a landscape having an attractive balance of the kinds of vegetation that grow well there—grasslands, woodlands, hedgerows, and tilled fields, all neatly tended. It means clear streams that flow normally between grassy or wooded banks, and silt-

free impoundments dotting a well-kept landscape.

When the recreationist arrives at his destination, he may be in for more disappointments. How could he have known that the advertised "beach" was an unimproved, stony shore? That the "delightfully airy cabins" are poorly kept? That the walking trails are filled with mudholes and lined with poison ivy?

The reasons for these shortcomings are varied and, regrettably, often deeply seated in our customs. Bringing about needed changes will, therefore, not come easily. Regulation through zoning and licensing, no doubt, will be required to reduce the undesirable placement of billboards, auto graveyards, and the like. Community pride will have to be developed to overcome many of the careless habits of individual citizens and small businessmen.

As rural America becomes more and more interrelated with urban America, matters of appearance and quality of recreation areas are of mutual concern. They affect the *use* of resources, and they affect the *income* of farmers and other rural residents.

The Soil Conservation Service is concerned with these effects on resources and people. More important, SCS people helping landowners plan recreation developments have an opportunity and responsibility to influence favorably the use of resources and the looks of the scenery.

## Community Planning

Several approaches promise to bear fine fruit in solutions to some of these problems.

The improving competence of State highway agencies will have its effect on the secondary road systems.

Coordinated resource planning and development, as in watershed and RC&D projects, can and should include the kinds of things needed to make rural areas truly "America the Beautiful." Community planning to provide for open space in urban development and preserve natural areas in the rural scene is gaining acceptance.

The citizens' groups having special interests in outdoor beauty—Audubon societies, women's clubs, civic clubs, chambers of commerce—can play their parts in resource development as well as agencies and groups having other interests.

Our work in broad resource planning comes to fruition in specific operations: A roadside erosion control and revegetation job with a road maintenance agency; a zoning rule relating kinds of use to kinds of land; construction of a reservoir with its attendant public recreation facilities.

Probably most important of all is the service made available to private land owners and operators. Here we can furnish sound guidance to help them establish and operate recreation enterprises of high quality.

If picnic tables are needed, designs can be recommended that will stand hard use for many years, not deteriorate quickly into junk.

If a water supply is to be built, assistance in choosing appropriate facilities will assure that they not only meet public health standards but also fit well into the landscape.

Our sound advice will help them build quality recreation enterprises that will attract a good clientele. Everyone in the professional field who is offering recreation service needs continually to emphasize the importance of quality in the facilities and in their operation.

Quality pays; substandard operations are doomed to failure.



Here's how to—

## ATTRACT BIRDS AND OTHER WILDLIFE TO RURAL AREAS

By Roy A. Grizzell and  
Verne E. Davison

*Field Biologists, SCS, Little Rock, Ark.,  
and Portland, Oreg.*

**S**ONGBIRDS and other wildlife bring joy to people living in rural areas. Many operate feeding stations around their homes for birds. Because of their surroundings, rural residents have an advantage over city dwellers in managing their land to attract a wide variety of birds and other wildlife.

People interested in attracting wildlife to their property can begin by sizing up the availability of food, cover, and water, which are the basis of all wildlife management. Of these, food usually is the most important.

Here are some specific suggestions that you can use if you have a piece of land under your control, whether it be a rural retreat or a working farm or ranch:

### Things to Do

First and foremost, be a good conservationist. Eroded soil produces no food, no cover, and only muddy water when it rains. Can you see from one end of the property to the other? If so, you need windbreaks, shrubby fence rows, or a woodlot. What you already have will determine what else you need.



A windbreak with herbaceous undergrowth provides nesting places and shelter for many kinds of birds.

### Develop a Food Supply

You will want a feeding station near the house. Locate it so you can observe the birds.

Include one or more suet baskets tacked onto a tree. If no trees are present, plant one or erect a post to serve as a substitute.

Obtain or build a sunflower dispenser. A plywood box with a small hole in the bottom, or a coconut cut in half and held together by three wires, is satisfactory. Adjust the opening to permit titmice, chickadees, nuthatches, and other small birds to obtain the sunflower seeds.

Also provide a tray-type feeder or dispenser. If you don't want to build the feeders yourself you can purchase them from advertisers in outdoor magazines.

You can feed any of the recommended birdseed mixtures or you can buy scratch feed from a farm supply store. Supplement these basic foods with raisins to attract the fruit eaters (mockingbirds, brown thrashers, and the like) and nuts for such birds as cardinals, finches, and bluejays.

Even more important in rural areas is food produced by planted crops and by shrubs, vines, and trees. Here are some ideas:

Plant a quarter-acre food patch on each 20 acres of land. Make it a cafeteria. Include a millet, such as browntop, and several rows of lespedeza. Other good foods are sunflowers, wheat, and corn.

To combine cover with food you can plant a multiflora rose fence. Use the thornless type of rose in urban areas or on small lots. Multiflora rose can become a pest where there is idle open land nearby. Rose hips are choice food for mockingbirds and cedar waxwings. They are fair for cardinals, robins, and a few other birds, especially in winter when snow covers the ground.

For the fruit eaters plant several mulberry trees. Locate them at some distance from the house to avoid stains on clothes, floors, and cars. Mulberries are among the first fruits to ripen in the spring and furnish choice foods for bluebirds, bobwhites, indigo buntings, catbirds, great-crowned flycatchers, bluejays, kingbirds, mockingbirds,



Baltimore and orchard orioles, robins, summer tanagers, brown thrashers, wood thrushes, towhees, vireos, cedar waxwings, woodpeckers, and squirrels.

One of the next fruits to ripen is black cherry. Songbirds flock to ripening cherries just as they do to mulberries.

Other fruits that will attract most of the fruit-eating songbirds are blackberry, wild grape, elderberry, cherry elaeagnus, dogwood, autumn-olive, blueberries, and pokeberry.

For the nut-eaters there are many good choices. To produce the maximum amount of food, the trees need sufficient growing space. Sometimes it is necessary to thin them or remove competing species.

The various oaks are among the best producers. Other important nut-bearing trees are beech, chinquapin, hickory, pecan, various species of pines, and walnuts. Birds do not normally crack hickory nuts and walnuts, but squirrels and other animals do. Birds then feed on the bits dropped by the animals. If you will gather nuts and crack them, the birds will flock eagerly to the site.

Rural land can be managed for

insect-eating birds by providing well-kept lawns around residences, well-fertilized and mowed pastures, brushy fence rows, and a variety of tree species in farm woodlands.

### Cover

A variety of kinds of cover is needed. There should be nesting sites during the summer, escape and roosting cover, feeding cover, and vegetation to provide shelter from winter storms. All are important.

Windbreaks commonly supply both cover and food for resident and migrant songbirds. A variety of species are better than just one or two.

### Water

During the past 20 years more than 1¼ million farm ponds and more than a thousand floodwater-retarding structures have been built in the United States. Almost without exception the ponds and lakes attract songbirds as well as waterfowl and shore-birds. Martins and swallows capture insects over the water. Doves and other birds come to drink. A willow tree or cattail clump may harbor

a nest of yellow warblers or red-wing blackbirds. One of the most interesting places of all to enjoy and watch birds is at or near a pond or lake.

### Artificial Attractions

Bird boxes add to nesting sites in rural areas. Bluebird boxes nailed to fence posts will substitute for natural tree cavities, often being used by starlings. Boxes with small openings give nuthatches, chickadees and titmice a chance.

Around the edges of ponds and lakes you can erect martin houses and wood-duck boxes. If you have raccoons consider using the duck box developed by the Patuxent Research Center of the Fish and Wildlife Service. It effectively prevents predation by raccoons, squirrels, snakes, and the like.

Squirrel boxes will substitute for natural tree cavities where mature and overmature trees are lacking.

Platforms erected over water will be used by mallards, black ducks, and geese in the northern parts of the United States.

Conservation farmers and ranchers, as well as nonfarm rural residents, can use these ideas to make their land more attractive for birds and wildlife and help preserve this important heritage.

### Open Windbreaks

Forester John J. Zaylskie of North Dakota State University Extension Service reports that comparatively open single-row windbreaks distribute snow more evenly on cropland than dense or multirow barriers. Evenly distributed snow builds up soil-moisture reserves over a large width of field.



Farm ponds have many uses—to water livestock, for fire protection, and to provide fishing and other recreation.



A field planting of tickclover, proso millets, Texas millet, cowpeas, sunflowers, guar, and soybeans produces wildlife foods.



# Gravity Flow Sprinkler System For Foothill Irrigation

A UNIQUE system that has turned foothill irrigation from a problem into a blessing is rapidly gaining favor in the Teton and Star Valley soil and water conservation districts in the mountain valleys at the foot of the Grand Teton Mountains and may well be adapted to similar terrain throughout the country.

The gravity flow sprinkler system makes use of the altitude of the water source to operate the sprinkler heads and distribute the water. It has all but eliminated the many irrigation problems in foothill irrigation and has created so many new advantages—including economy and dependability—that local Soil Conservation Service people and the sprinkler companies have all they can do to keep up with installation orders.

In the Alta area of the Teton district on the Wyoming-Idaho border, the system is being used by 45 farmers—nearly all the irrigators—on 5,000 acres. Another 30 operators use the system on 3,000 acres in the nearby Star district, and applications for installation are coming in each year from smaller communities throughout the Teton district.

Irrigation in these valleys had been most unsatisfactory before the use of the gravity flow sprinkler system. Water was carried through open contour ditches. The water-loss was extremely high, maintenance costly and time-consuming, and the waterflow difficult to control. There was usually a shortage during the peak periods of use—when the water was needed the most.

With the open ditch systems it was almost impossible to efficiently irrigate every corner of ev-

ery field. To do so, an intricate system of ditches was needed, and labor requirements were very high. This not only required cutting up good farmland but hampered farm operations and required long hours of maintenance work.

The small family farms in the area and the average production yields of the soil would not justify the installation of regular sprinkler irrigation systems with power driven pumps.

The area was ready-made for the gravity flow sprinkler system. No one is quite sure who first thought up the idea, but from 1958 on, when the first ones were installed in the Alta area, the SCS took the leadership in their design and installation. Harold Birkey, SCS area engineer at Jackson, Wyo., has assisted work unit

personnel with these systems from the beginning. Sprinkler companies, in meeting in Wyoming, Idaho, and Utah, have worked closely with SCS technicians on the design specifications, and capacities.

The system needs an operating head, or elevation distance, of from 90 to 100 feet or more above the area to be irrigated. SCS technicians compute the water-holding capacity of the soil and the water required to grow crops under normal conditions. With this information, plus the size of the field to be irrigated, steepness of the slope, and other data, the size of the pipe and the design of the system can be prepared.

Waterflow is controlled through concrete inlet structures at the origin of the water. Individual cutoff valves permit easy operation. The water, when the system is in operation, flows down the steep hill through an underground pipe into another pipe system bordering the field. Sprinkling is done by means of light weight aluminum pipes and rotating sprinkler heads that can be moved easily and quickly



Pipes for gravity sprinkler irrigation systems in foothill country of the Teton SCD in western Wyoming are being installed.





The gravity flow sprinkler systems used in western Wyoming have brought many benefits to the ranchers and farmers in the area.

from place to place. The pressure from the gravity flow down the steep hill permits equal flow through the pipe's length and operates the sprinklers.

Low cost and high efficiency are perhaps the two top advantages of the system. Cost of installation runs slightly more than \$100 an acre on the average. Group installation naturally makes it cheaper. The usual group runs from 2 to 6 operators, although it has run as high as 12 in the Alta area.

Financial assistance is given through Government cost-sharing programs with the installation of complete conservation planning, including water management, crop rotation, and other measures.

With gravity flow sprinkler irrigation, wasted acres are kept to a minimum. All corners of the field receive equal moisture, and as much as 10 percent of the land once used for ditches under the old system can be returned to production.

Technicians estimate that production has increased by 200-300 percent and even more by operators who have had the system in at least 1 full year. With this and

other improvements, it pays for itself within a short time.

In addition to these and other benefits, the system has eliminated the danger of erosion and ended the constant battle the farmers used to have keeping down the weeds along the old irrigation ditches.

Typical of the small operator benefiting by the gravity flow sprinkler irrigation system is Elwin Schofield, who operates 200 acres near Alta, and who, like most of his neighbors, diversifies his enterprise with alfalfa, small-grain, and irrigated pasture for a 67-head Holstein dairy herd and a few yearlings. Schofield admits that he was "hard to convince," but that now he is "completely sold" on the gravity flow sprinkler system.

He said the year before his system was installed in 1958 he had to buy 90 tons of hay but hasn't had to buy any since.

He now is able to keep his yearlings an additional 4 or 5 months, adding between 300 to 400 pounds to their market weight and at least \$75 additional profit per animal to his pocketbook.

Schofield said he cut 200 tons of hay this year. The second crop got wet just before cutting so he decided to use it for pasture. He says he is able to use every acre of his farm with the gravity flow sprinkler system, giving him at least 10 percent more acreage, and about two to three times more production.

"That's without fertilizing" he says. "Heaven knows what I'd get if I fertilized. I just don't need to."

Schofield estimates he saves another \$300 or so a year in labor costs. He said it was necessary to hire an irrigator at a cost of about \$120 a month.

Now he says that he, his two young daughters, and his son can move all four of the portable aluminum lines in an hour and a half.

"Then the job's done, you can go off and forget about it," he said.

## Secretary Establishes Research Committee

Secretary of Agriculture Orville L. Freeman has set up an Agricultural Research Planning Committee to assure continued cooperation between USDA and other agencies in planning and coordinating agricultural research programs.

The Secretary said there has been a steady increase in public support for agricultural research through the years. Today the ratio between Federal and non-Federal sources of funds for agricultural research is about 60 to 40.

Membership of the body includes the director of science and education, USDA, as chairman; six representatives of State universities and Land-Grant colleges; six representatives from research agencies of the Department; a member nominated by the National Academy of Sciences and one by the Office of Science and Technology, and a USDA official as vice chairman.



# Natural History Societies

## National Audubon Society Serves Growing Interest in Nature

By John Vosburgh  
Editor, *Audubon Magazine*

THE National Audubon Society, which holds its 60th annual convention in Tucson, Ariz., November 7-11, serves a growing public that finds the study and appreciation of nature a major source of outdoor recreation.

The Society's extensive influence is far out of proportion to its membership of 44,000—a figure which has been steadily increasing. There are now 107 branch societies and 241 other affiliated groups in 50 States.

In its 1962 Report to the President and Congress, the Outdoor Recreation Resources Review Commission estimated 18 million people of 12 years of age or older took part in nature or bird walks during June-August 1960. By 1976 this figure will reach 27 million, the report said, and by the year 2000, 49 million.

The National Audubon Society states its philosophy as the belief "in the wisdom of nature's design" and pledges vigilance to protect nature's resources. Its long-standing authority and leadership in the study and protection of birdlife now extends with equal emphasis to all forms of wildlife, plant life, land use, water, wilderness, and scenic areas.

As befits the first national organization to establish a wildlife sanctuary (in 1902 by the forerunner of the present organization), the Society now provides warden protection to about a million acres of wildlife land. It sends 35 naturalist-photographers annually to more than 200 cities in the United States, Canada, and the West Indies to present wildlife

film lectures. Audubon Junior Clubs have enrolled more than 11 million young people since 1910.

The society publishes: *Audubon Magazine*, now in its 66th year, *Audubon Field Notes*, and *Audubon Nature Bulletins*. It distributes nature films and photographs, conducts wildlife research, operates a service department of educational aids and nature items, counsels communities on starting nature centers, and maintains 5 large centers of its own as well as 4 summer camps that have been instrumental in educating some 10,000 nature leaders since 1937.

The interest in birdlife alone is pressing the Society's information services.

Allan D. Cruickshank, the author and bird photographer, recently estimated that "more than a million people in the United States and Canada enjoy birdwatching as a sport or as part of scientific projects."

This is considered a conservative estimate, applying only to the most serious birders who compile life lists and take field notes.

John K. Terres, Nature Editor for J. P. Lippincott, publishers, estimates that "at least 10 million people in the United States maintain a definite interest in birds." He bases this on letters from readers of his bird and nature books, and on other indices.

Advertisements for a line of birdhouse kits which appeared in magazines last spring produced half a million orders. Even well after the nesting season, the manufacturer was sending out at least 1,000 kits a week in midsummer.

The burgeoning interest in nature and related outdoor activities is also reflected in the 12,271,091 circulation of 17 conservation-related magazines. A recent survey showed a circulation of 472,808 for 30 nongovernment conservation

magazines.

The National Audubon Society is gearing itself to cope with this massive turn to nature and related activities with all the attendant conservation needs and problems. The 93 percent increase in the number of nature and bird walk enthusiasts predicted for 1976 poses a challenge to nature organizations even more formidable than the wilderness presented to John James Audubon.

## Regional, Local Groups Have Diverse Programs

By Shirley A. Briggs  
Editor, *Atlantic Naturalist*

The number and diversity of conservation and natural history societies in North America reflect the growing interest in knowing more about our natural world and a concern with the problems of preserving it.

There are clear divisions of function and scope between national organizations and regional or local ones. The national groups deal mainly with particular aspects of the subject or problems of national or continental interest. They usually have professional staffs to carry out programs. The National Audubon Society, National Wildlife Federation, Izaak Walton League, Wilderness Society, and Nature Conservancy are examples.

The regional, State, and local organizations are even more diverse. They usually concentrate on education in the natural history of their areas and grapple with conservation problems in their own neighborhoods. They function through direct action of their members. Such groups commonly conduct field trips and classes, make studies of scientific worth, work with schools, publish magazines and booklets, preserve natural areas, and, as occasion demands, present their case to public officials.

The many autonomous regional and State Audubon societies are



typical of these organizations. Their ties with the National Audubon Society, which many of them antedate, are those of cooperation, not legal association. They vary from small town and city clubs to such a large and influential group as the Massachusetts Audubon Society—oldest in the world, with more than 9,000 members, having several sanctuaries throughout the State, conducting professional research programs, teaching children through the State school system and in summer camps of their own, presenting lectures, and producing publications.

Smaller groups often manage almost as active a program, depending on volunteer rather than paid staffs. Notable programs are

carried out by Audubon Societies of Rhode Island, Florida, Michigan, New Jersey, Illinois, New Hampshire, the Audubon Naturalist Society of the Central Atlantic States, and many others.

In many States, the ornithological societies have similar programs. Natural history societies of other sorts also are prominent in this field, both those with a broad range of interests and those that specialize, perhaps in botany, or geology, or herpetology. The Federation of Ontario Naturalists is one of the largest and most effective of these organizations, with more than 3,000 adult members, and more than 12,000 children enrolled in its Young Naturalists' Club.

## Rate of Progress in SCS Programs Shows Increase in Fiscal 1964

More conservation plans prepared, more landowners assisted, and more landowners applying conservation practices in fiscal year 1964 than in 1963 is the picture of the past year's conservation progress emerging from preliminary totals of SCS activities reports.

Data from work units and other field offices are processed at the USDA Management Data Service Center in New Orleans. Major items now available, but still subject to final verification, indicate substantial increases in conservation planning and application through SCS programs during the year.

SCS provided assistance in the preparation of 108,600 conservation plans in fiscal 1964, compared to 105,500 in 1963, an increase of about 3 percent. About 92 percent or 99,900 of the plans were prepared in regular soil conservation district operations, the others in watershed protection, Great Plains Conservation, or other programs administered by SCS.

Through all its activities, SCS

provided planning or application service to nearly 1,124,000 landowners in fiscal 1964, compared to 1,042,000 in 1963. Of these, 1,039,000 were serviced through regular district operations in 1964, compared to 964,000 in 1963. About 752,000 landowners (681,000 in districts) applied one or more practices in fiscal 1964, compared to 666,000 (620,000) in 1963.

SCS consultive services to planning agencies, organizations, and individuals increased 35 percent in 1964, to a total in all programs of 84,000 services, compared to 62,000 in 1963. Ninety-six percent of consultive services were provided through soil conservation districts—80,000 in 1964 and 59,000 in 1963.

In the Great Plains Conservation Program landowners signed 3,719 new contracts covering 5,453,644 acres in 1964, compared to 2,852 contracts on 5,051,330 acres in 1963.

Planned cropland conversion in the new contracts will take 248,626 acres of land out of cultivation

and put it into grass or other uses, compared to 191,826 acres in previous year. Great Plains contracts to June 30, 1964, provide for conversion of a total of 1,112,333 acres to grass. This figure is 23 percent or almost a fourth of the cropland in farms and ranches participating in the program.

Preliminary totals from 2,971 districts showed also that districts added 115,500 new cooperators operating 41.4 million acres in 1964, compared to 115,000 new cooperators operating 39.8 million acres in fiscal 1963. Nearly 2 million land owners and operators of 647.2 million acres of land were district cooperators at the end of the fiscal year.

The acreage of soil surveys increased slightly in soil conservation district operations but declined slightly through other programs. The total of all standard soil surveys completed with SCS funds in fiscal 1964 was approximately 62,080,000 acres, compared to 64,440,000 in 1963, and bringing the total to date to 523,208,000 acres. Ninety-five percent of the 1964 surveys, or 58,807,000 acres, were made in district operations, compared to 56,536,000 acres in 1963.

◆  
Soybeans, a minor crop a half century ago, now are the Nation's fifth most important cash crop and its most important source of vegetable oil.

◆  
Moisture, nutrients, and soil-blowing preventives are lost when fields are burned before plowing.

◆  
When planting trees, shrubs, and ornamentals, be sure the soil is filled in around the roots, and not just over them.

◆  
Teaching, research, and extension education by Land-Grant Institutions and the USDA play an important leadership role in the world's agricultural progress.



# New Publications

**Grass in Conservation in the United States.** By the Soil Conservation Service (various authors). 1964. USDA, SCS-TP-143. 43 pp., illus.

This publication focuses attention on the "grassland revolution" in American agriculture which, since the drought and depression of the 1930's, has raised grass (including legumes) from a minor resource on farms and ranches to a major role in production and soil conservation.

Four papers by the Administrator of the Soil Conservation Service and his chief plant scientists document the role of SCS in developing the technology and motivating the land use changes that brought the revolution to fruition. Today grass grows on about half the Nation's land and returns \$17 billion annually through livestock products.

Administrator D. A. Williams writes of the historical background, B. D. Blakely of grass on farmland, B. W. Allred of private rangeland, and A. L. Hafenrichter and A. D. Stoesz of new grasses and legumes.

A chronological list of publications on grass by the SCS and a selected list of technical articles and bulletins published outside the Department detail the published record of the grassland revolution.

**Manual of Outdoor Conservation Education.** By Joseph J. Shomon. 1964. *National Audubon Society, New York. Inf. Ed. Bul.* 3. 96 pp., illus. This bulletin provides information about how to establish and operate nature centers, outdoor laboratories, outdoor education classrooms, special park and forest areas, nature preserves and sanctuaries, natural or semi-wild areas, and camp reservations for educational purposes,

**Rural Recreation Enterprises in New England.** By Elmer J. Moore. 1964. *U. S. Dept. Agr. Agr. Econ. Res. Rpt.* 56. 27 pp. Investments, returns, and problems of 32 selected enterprises are discussed.

**Legumes and Grasses in Dryland Cropping Systems in the Northern and Central Great Plains.** By Paul L. Brown. 1964. *U.S. Dept. Agr. Misc. Publ.* 952. 64 pp., illus. The literature is reviewed and the value of legumes and grasses as soil-conserving and soil-improving crops discussed State by State.

**Summary of Reservoir Sediment Deposition Surveys Made in the United States Through 1960.** Compiled by James A. Spraberry. 1964. *USDA Misc. Publ.* 964. 61 pp., illus. Summary by the Agricultural Research Service of data from all known U. S. reservoir sedimentation surveys.

**Annual Lespedezas, Culture and Use.** By P. R. Henson and W. A. Cope. 1964 *U. S. Dept. Agr. Farmers' Bul.* 2113. 16 pp., illus. This bulletin, superseding *Farmers' Bulletin* 1852 and Leaflet 240, discusses the use of annual lespedezas in the eastern half of the United States as forage crops for midsummer and early fall grazing.

**The Pinyon-Juniper Type of Arizona: Effects of Grazing, Fire, and Tree Control.** By Joseph F. Arnold, Donald A. Jameson, and Elbert H. Reid. 1964. *U. S. Dept. Agr. Prod. Res. Rpt.* 84. 28 pp.

**Stream-Gaging Stations for Research on Small Watersheds.** By Kenneth G. Reinhart and Robert S. Pierce. 1964. *U. S. Dept. Agr. Hbk.* 268. 37 pp., illus. General guide on the design and construction of small stream-gaging stations.

**Farm Costs and Returns.** By Economic Research Service. 1964. *U. S. Dept. Agr. Inf. Bul.* 230. 93 pp., illus. Summary esti-

mates of costs and returns for 1963 and earlier years on selected commercial farms and a brief analysis of changes occurring in production, prices, income, and costs for each of these types of farms.

**Cotton Irrigation in Southeastern United States.** By O. L. Bennett, B. D. Doss, and D. A. Ashley. 1964. *U. S. Dept. Agr. Inf. Bul.* 282. 16 pp., illus. A nontechnical summary of latest information on moisture requirements, methods of irrigation, and management of cotton in the humid South.

**Micro-organisms.** By C. R. Benjamin, W. C. Haynes, and C. W. Hesseltine. May 1964. *USDA Misc. Publ.* 955. 36 pp. What microorganisms are, where they grow, and what they do.

**The Ohio River Basin.** By Inter-League Survey Committee for the Ohio River Basin. 1964. *League of Women Voters Education Fund, Washington, D.C.* 51 pp., illus. 75c. An attractive and well illustrated report on the major problems of the Basin—floods, pollution, inadequate recreation sites, and economically depressed areas—and what is being done about them.

**25 Years with the Soil and Water Conservation Districts in Wisconsin.** State Soil and Water Conservation Commission. 1964. *Madison.* 38 pp., illus. A bird's-eye-view of districts' part in getting conservation on the land in the past 25 years.

◆  
An application of nitrogen fertilizer on a stubble field will hasten decomposition and make the stubble even more valuable once it has been plowed or worked into the soil.

◆  
Brief exposure to radio frequency (r-f) electric energy has increased germination of alfalfa seed by 35 percent in USDA laboratory studies.



From the Administrator:

## *Civil Rights Act • Rural Beauty*

SINCE July 2 of this year when the Civil Rights Act of 1964 became the law of the land, there has necessarily been much discussion about it. Secretary Freeman personally discussed the effect of the new law on Department of Agriculture programs with all his State and Regional directors at a meeting in Washington the week of August 3. He told them that each of them would be required to see that the act is followed in the programs they administer.

"We share with you a firm belief that discrimination has no place either in the way an agency operates, or in the programs that it administers," he said.

During the same week, I discussed the application of the law to programs administered by the Soil Conservation Service, with all State conservationists.

Title VI of the act is the part that applies to SCS programs. This states that "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

This provision applies to the Small Watersheds Program, to the Flood Prevention Program, and to the Resource Conservation and Development Program. It also applies to all assistance provided to soil conservation districts. In this latter case, technical assistance supplied to districts is interpreted by the Department of Justice to be "financial assistance."

State conservationists have, or soon will have, advised district governing bodies and sponsoring organizations about Title VI and its application to soil and water conservation, watershed, flood prevention, and RC&D programs. SCS

is concerned to see that organizations participating in these programs understand the national policy of nondiscrimination.

Actually the Service, no less than the districts and sponsoring organizations, has been so occupied with the planning and applying of conservation measures to land and water resources that there has been little room for discrimination. The question of what kind of a man owns or operates any land is not germane to the question of need for the conservation and development of land and water resources. It ought to be pretty easy to stay on the right side of the law in these programs!

There was consideration of including the nondiscrimination clause cited above in all Memorandums of Understanding between the Department of Agriculture and soil conservation districts, and in the Supplemental Memorandum between the districts and SCS. But this was not practical. The act applies, whether it is in memos of understanding or not, and whether anyone agrees or not.

Principal matter for attention now is to be sure everyone involved understands what is needed and avoids discrimination. The act applies only to program availability, insofar as resource conservation programs are concerned—not to employment, contracting, or other activities covered under executive orders or other laws.

But, whatever the activity or the legislation applying, there must be no discrimination either as to availability of the benefits of programs or to the priorities of services rendered.

APPEARANCE of the countryside is of concern to all Americans with pride in their native land and interest in its future. It is one of the important concerns

of conservationists everywhere.

Soil conservation districts and watershed projects are making important contributions to the beauty of rural America. Everyone sees beauty in rolling land with contour strip crops, shady trees, grassed slopes, and sparkling ponds and streams. Conservation on the land always looks good!

Unfortunately, there are uses of the land as unsightly as the shocking scars of erosion and deposits of sediment that soil conservation efforts are gradually erasing. Such things as rural slums resulting from unfortunate housing or commercial developments made without the benefit of soil surveys, and the roadside automobile "graveyards" on the edge of every town and city, are depressing sights that detract from the rural scene. To say the least, they do not help the rural economy or add to the prestige of rural people.

One such slum or graveyard breeds others. And they are so unnecessary!

Perhaps ridding a community of these deplorable sights would not be considered strictly a "conservation job." But those who take pride in the countryside, as do soil conservation district leaders and the dedicated professional people who assist them, could hardly refrain from urging the elimination of things that sell rural America short. They can be depended on to lend a hand to efforts to preserve natural beauty and remove manmade blemishes.

As our population moves more and more over the landscape, as it inevitably must, it can do so in an orderly manner. It can help to enhance, not undermine, the appearance and prestige of rural communities. Why don't we all help to build America the Beautiful?—D. A. WILLIAMS



If your address changes, please notify us of your complete new address, including zone or RFD number, and include old address with our code number as shown above.

## Conservation Makes Showplace of Farm

A \$60,000 conservation program on a 435-acre irrigated farm in Adams County, Colo., has made it a showplace in the highly productive irrigated area north of Denver.

In a little over a decade, James E. Fry of Brighton, a cooperator and member of the board of supervisors of the West Adams Soil Conservation District, has moved over a quarter of a million cubic yards of earth in leveling his fields, laid 3 miles of concrete pipeline, and constructed a storage reservoir.

In this program he has used ASC cost-sharing assistance and was the first Great Plains Conservation Program cooperator in Adams County.

Mr. Fry finds time for other activities besides his farm operations. He served as secretary of the board of supervisors of his district from August 1951 until his election as chairman in March 1964. He is co-chairman of the Great Plains Conservation Program Committee of Districts.—CHARLES E. DAVIES, *Work Unit Conservationist, Brighton, Colo.*

## SPRINGS SOLVE WATER PROBLEM



SPRINGS and seeps are proving to be the answer to the water supply problem in the Pike County Soil Conservation District, Ala. The topography of the area does not permit building a reservoir, and sandy soils and other conditions make ponds impractical on some farms.

Farmers there have developed nearly 100 springs and seeps at an average cost of about \$60, excluding labor. They now have an abundance of cool, clear water to meet

the needs of the farms, including a growing livestock industry. One spring supplies water for a farm and for 17 homes, 5 stores, and a small laundry in the town of Banks.

Pictured (l. to r.) are District Supervisors Sam S. Williams, James W. Mills, and Max Blackmon and Soil Conservation Service Conservationist Jimmy Green examining the water in a storage tank at a spring on the J. E. Dean farm.



NOV 17 1964

DECEMBER 1964  
VOL. XXX, NO. 5

CURRENT SERIAL RECORDS

# Soil Conservation

NEW SOIL CLASSIFICATION—Page 99

MINIMUM TILLAGE—Page 103

*Soil Survey Use in Iowa*—Page 109





# Soil Conservation

*Finally . . .*

Fifth Approximation, 6th Approximation, 7th Approximation . . . Ever since the soil survey became a part of SCS, we have been hearing soils men talk about those mysterious documents that have something to do with a new soil classification. Now that the new system is going into effect, we arranged for Writer Joe Larson to dig into the matter for us. His article (p. 99) is based on a study of the 7th Approximation (the last one), talks with Guy Smith, its senior author, and discussions with others concerned with soil surveys and soil interpretations.

**Plow Sense:** Regard for the soil as a natural body whose structure is important to its function leads the wise plowman to mutilate it as little as feasible in growing his crops. This principle is ignored by those who think that soil conservation can be done entirely by trapping water with dikes or dams or by massive land shaping. Contributed articles in this issue (p. 103) show that the principle of minimum tillage is finding wide acceptance among modern farmers.

**Cover:** The Grundy Experimental Farm near Beaconfield, Iowa, is one of the sources of long-term crop yield records (p. 109) in that State. The Grundy soils are on the ridge tops. Photo by Iowa State University Photographer Chuck Benn.



## CONTENTS

- 99 New Soil Classification**  
What will it mean to the soil survey user?
- 103 Minimum Tillage**  
For corn and soybeans  
*By William J. Keyes*  
For potatoes  
*By William A. Hayes and Clifford Roy*
- 106 New Grasses for the Southeast**  
SCS plant materials centers turn to natives  
*By W. C. Young and H. L. Leithead*
- 107 Wind Erosion Control Guides**  
Curves adapt basic research to show soil loss  
*By J. W. Turelle*
- 109 Soil Survey Use in Iowa**  
Crop yield data help farmers, tax assessors  
*By W. D. Shrader and F. F. Riecken*
- 111 Roadside Beauty and Safety**  
Drivers reap benefits of erosion control  
*By L. D. Eagles and O. S. Kirkpatrick*
- 113 Mechanical Sodding Method Solves Waterway Problem**  
*By Larry H. Long*
- 115 Sinkhole Ponds Provide Water in Limestone Area**
- 116 Nursery Alternates Trees and Cattle**
- 117 Monterey Pines Make Good Christmas Trees**  
*By Clark L. Moore*
- 118 Review**  
Farmers World: The Yearbook of Agriculture, 1964
- 119 From the Administrator**  
Great Society; Technical Guides; Keeping Up

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

Editor  
BEN O. OSBORN

Editorial Assistant  
GEORGIE A. KELLER

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Prints of photos can be obtained on request.

**Subscriptions:** Price \$1.50 per year, \$2.50 foreign. Single copy, 15 cents. A discount of 25 percent will be allowed on orders of 100 or more sent to the same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.



# New Soil Classification

## What will it mean to the soil survey user when the revised system goes into effect?

ON January 1, 1965, the National Cooperative Soil Survey will start using a new soil classification system that has been in development for nearly 15 years.

This new system represents a major advancement in soil science but it will hardly cause a ripple in the day-by-day work of most soil survey users, according to Dr. Guy D. Smith, director of soil survey investigations, SCS, and principal architect of the system.

Nevertheless, the new system will be a definite asset to all those working with soils. It will permit a higher degree of accuracy in classifying soils, afford greater efficiency in mapping, allow classification of some soils left orphans in previous systems, and establish a flexibility heretofore lacking in soil classification.

### Soil Names Unchanged

In the new system the 8,000 soil series and their 80,000 or more soil types and phases remain, for all practical purposes, unchanged. The changes come in the families, subgroups, great groups, suborders, and orders under which the series are classified.

The new system, therefore, will not alter the basic content or form of the soil survey report with which soil conservationists, land use planners, and others are familiar. It will not require any major overhaul of technical guides in SCS work units, of land capability classifications, nor interpretive groupings for engineers, woodland conservationists, biologists, or other users of soil survey information.

The improved understanding of

the relationships of kinds of soil, greater accuracy in grouping those that are similar, and convenience in referring to meaningful groupings, however, may be expected to lead to a gradual improvement in the interpretation and application of soils information.

### Need for New System

The need for a better classification system has been apparent for some time. Work with soils during World War II reemphasized this need for a classification that showed relationships among the soil series.

Following the war, farming systems throughout the United States underwent drastic changes. The availability of cheaper fertilizers alone called for more precise information about soils and their responses under different management systems.

In addition, soil surveys today have a wide variety of nonagricultural uses, such as planning of suburban residential developments, location of routes for pipelines and highways, and community zoning. These uses also demand more and more precise knowledge about the nature of the soil and its behavior.

### More Exact Definitions

Narrower and more precise definitions of the properties of the soil series, types, and phases have been in demand. As a result of this demand and of the study of new areas, the number of soil series has grown tremendously. In 1913 they numbered 534. They rose to 1,400 in 1936 and 5,000 in 1949. Today they are about 8,000. The

sheer number of series has made the use of the system difficult.

Interpreting soil surveys has been a bit like trying to use a library with an archaic system of cataloging and with books stacked at random, shelf upon shelf, floor after floor. The book titles (like the soil series) were perfectly adequate, but the system under which they were filed had outlived its usefulness. What was needed was a new logical arrangement that would bring books on the same subject together with related ones nearby.

This is, of course, an oversimplification of the soil classification problems, but the idea is there. A new soil classification, like a new catalog system for the library, was necessary to make the information conveyed by the series designations more usable.

The new system, the fourth one used by the soil survey staff, differs from the previous systems in many respects. One of the best ways to illustrate these differences is to briefly review what has gone before.

### Earlier Systems

Milton Whitney, Chief of the then Bureau of Soils, and his co-workers, published the first U.S. soil classification in 1913. This was the result of 13 years of study in about 500 counties. The system recognized soil types, soil series, soil provinces, and regions.

Soil provinces, such as the Atlantic and Gulf Coastal Plains, and regions, such as the Southwest Arid Region, were conceived by Whitney as geographic areas with more



or less homogeneous geologic history. He defined a soil series as "a group of soils having the same range in colors, the same character of subsoil, particularly as regards color and structure, broadly the same type of relief and drainage, and a common or similar origin."

Soil types were subdivisions of series, mainly according to the size of the mineral particles and partly according to the structure and consistence. Whitney termed the combination of these properties "texture."

## Kinds of Soil

This classification had both merit and weaknesses. It was meritorious because it introduced the concept of the soil series and soil type as kinds of soil that could be identified and shown on maps. This permitted knowledge gained through experience and research with a specific soil to be used wherever the same kind of soil occurs.

The weakness was in the concept of soil provinces. The first American soil scientists, trained as geologists and chemists, looked upon soil largely as weathered rock. They felt that geologic processes that produced deposits of loose sediments were of prime importance to soil classification. Therefore, they defined soil provinces without considering the chemical, mineralogical, and physical differences in the soils found under different climates and different vegetations.

In the 1920's Dr. C. F. Marbut, then Chief of the former U.S. Soils Survey, attempted to correct this weakness. Drawing from the work of Russian scientists, Marbut maintained that a proper classification should rely on soil properties rather than geology, but somehow he failed to carry his belief far enough in his system. His classification was published in 1936, but only a few soil series were ever placed in the great soil groups as Marbut defined them.

This classification was drasti-



**NEW CLASSIFICATION.**—General soil map of the Eastern United States, showing areas dominated by orders and suborders indicated, usually with some inclusions of other groups. **ALFISOLS:** A1, Boralfs; A2, Aqualfs; A3, Udalfs; A4, Ustalfs. **ENTISOLS:** E2, Psamments. **HISTOSOLS:** H1, Histosols (mucks and peats). **INCEPTISOLS:** I1, Aquepts and Aquerts; I2, Aquepts; I3, Ochrepts; I3S, Ochrepts on mountains and steep slopes. **MOLLISOLS:** M1, Borolls; M2, Aquolls; M3, Rendolls; M4, Udolls; M5, Ustolls, including some Orthents, especially in western parts. **SPodosols:** S1, Aquods, including Histosols, Aquepts, and Psamments; S2, Orthods; S2M, Orthods on mountains and steep slopes. **ULTISOLS:** U1, Aquults, including some Aquods and Histosols; U2, Udults. **VERTISOLS:** V1, Aquerts; V2, Usterts.

cally modified in the 1938 Yearbook of Agriculture by Mark Baldwin, Charles E. Kellogg, and James Thorp, all soil scientists with the former Bureau of Chemistry and Soils. It was apparent, even then, that the modifications did not solve all the problems but there was not time to find the answers. Preparation of the Yearbook, however, demonstrated that an entirely new system was needed.

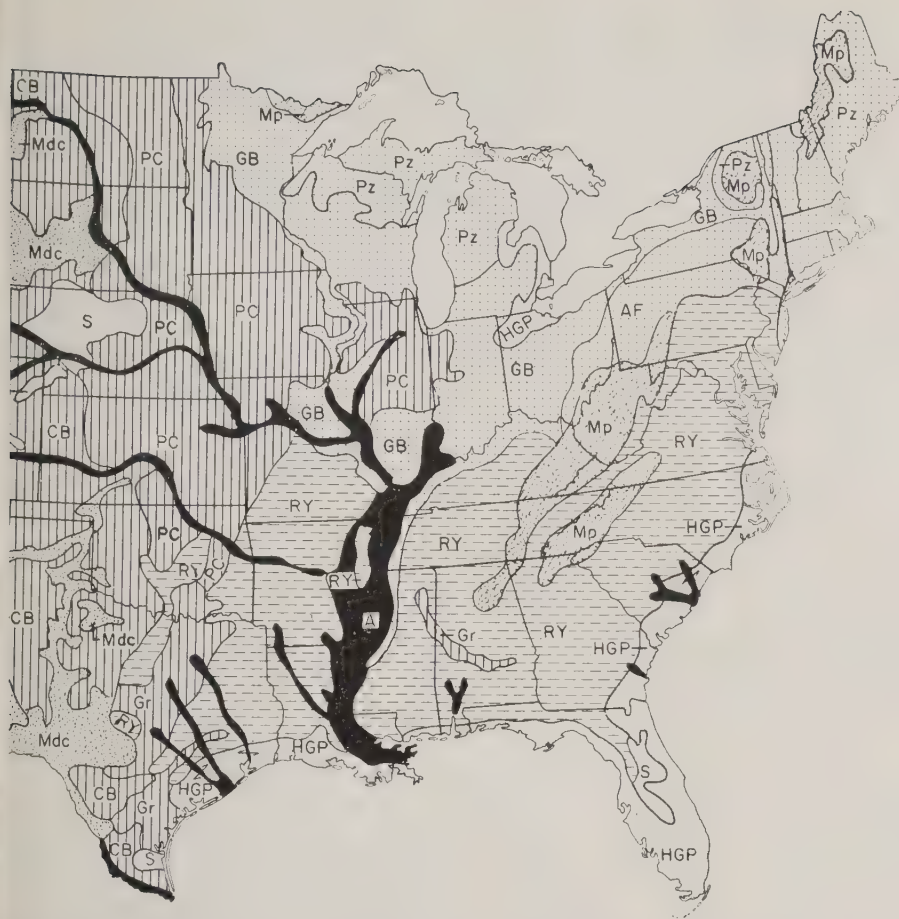
## The "Approximations"

In 1951 the soil survey staff began working on the new system under the leadership of Dr. Smith. This was no small task. The new

system not only had to fit the needs of today, but had to be flexible enough to absorb the soil knowledge of the future. It not only had to meet approval of soil scientists of the SCS, but also of some 60 cooperating agencies, both State and Federal. The suggestions and concurrence of scientists throughout the world were also sought.

It was apparent that the most useful system could not be achieved without the cooperation of a great many people—a number too large to work effectively as a group. Consequently the staff decided to develop the new system through a series of drafts, called "approxima-





**OLD CLASSIFICATION.**—General soil map of the Eastern United States showing areas dominated by the great soil groups indicated and usually including other soil groups—especially Alluvial soils, Regosols, and Hydromorphic soils—in areas too small to be shown separately. A, Soils of alluvial plains; AF, Sols Bruns Acides; CB, Chestnut and Brown soils; GB, Gray-Brown Podzolic and Gray Wooded soils; Gr, Grumusols; HGP, Humic Gley, Low-Humic Gley, Ground Water Podzols, and Bog soils (Hygromorphic); Mdc, Soils of mountains and steep slopes in arid to subhumid regions; Mp, Podzolic soils and Sols Bruns Acides of mountains and steep slopes in humid forested regions; PC, Prairie soils and Chernozems; Pz, Podzols and Brown Podzolic soils; RY, Red-Yellow Podzolic soils; S, Deep, very sandy soils (Regosols).

tions," and circulate these among the scientists for study, testing, and criticism. As defects were uncovered, corrections were made in subsequent approximations.

Seven approximations have been developed, each more elaborate than the preceding. The final draft, showing the placement of the 8,000 currently recognized series, is presently being circulated for review prior to publication, which is scheduled in about 2 years.

The new classification differs from that of Baldwin, Kellogg, and Thorp, which it replaces, in two important respects: (1) The nomenclature of the higher categories

is entirely new and (2) the definitions of the classes are much more quantitative and specific regarding limits between classes.

The definitions are set in terms of soil properties that can be seen or measured. These include soil texture, color, organic matter, mineralogy of selected horizons, the presence or absence of hardpan, and the depth to rock, among others.

### Soils as They Are Today

In discussing the new system, Dr. Smith points out that emphasis is placed on the properties of the soils as they exist today. Pre-

viously, soils were classified according to properties that they were believed to have had when the country was settled, even though subsequent cultivation or erosion might have destroyed or greatly modified them. This was always a stumbling block, since it was difficult to get agreement on the genesis of many soils.

Although the soil series are little affected by the new classification, a few that have wide ranges in properties will be split. However, these are mostly series that eventually would have been split even if the new system hadn't been developed.

### A New Language

In the new system the five categories above the series are family, subgroup, great group, suborder, and order. A whole new language was created for the upper reaches of the classification so there would be no confusion with names presently in use nor with words in any modern language.

This was no small task, for it was decided that each name should do two things: (1) Connote a major diagnostic property of the grouping to which it applied, and (2) show its position in the classification system.

The new terminology was devised with the assistance of authorities in the classics: Professor John L. Heller, head of the Classics Department, University of Illinois, and Professor A. L. Leemans, head of the Classic Language Department, University of Ghent, Belgium, with the assistance of Professor René Tavernier, head of the Geologic Institute, also of the University of Ghent.

The idea for the system of word forms that show the position of each name in the classification originated in the University of Ghent. Soil scientists then selected the properties that were diagnostic for each class, and the classicists proposed Greek and Latin terms for them. In some cases,



## New Soil Orders and Approximate Equivalents in Old Classification

Order	Formative syllable	Derivation	Meaning	Approximate equivalents
1. Entisol	ent	Coined syllable	Recent soil	Azonal soils and some Low Humic Gley soils
2. Vertisol	ert	L. <i>verto</i> , turn	Inverted soil	Grumusols
3. Inceptisol	ept	L. <i>inceptum</i> , beginning	Inception, or young soil	Ando, Sol Brun Acide, some Brown Forest, Low Humic Gley, and Humic Gley soils
4. Aridisol	id	L. <i>aridus</i> , dry	Arid soil	Desert, Reddish Desert, Sierozem, Solonchak, some Brown and Reddish Brown soils, and associated Solonetz
5. Mollisol	oll	L. <i>mollis</i> , soft	Soft soil	Chestnut, Chernozem, Brunizem (Prairie), Rendzinas, some Brown, Brown Forest, and associated Solonetz and Humic Gley soils
6. Spodosol	od	Gk. <i>spodos</i> , wood ash	Ashy (podzol) soil	Podzols, Brown Podzolic soils, and Ground-Water Podzols
7. Alfisol	alf	Coined syllable	Pedalfer (Al-Fe) soil	Gray-Brown Podzolic, Gray Wooded, Noncalcic Brown, Degraded Chernozem, and associated Planosols and Half-Bog soils
8. Urtisol	ult	L. <i>ultimus</i> , last	Ultimate (of leaching)	Red-Yellow Podzolic, Reddish-Brown Lateritic (of U.S.), and associated Planosols and Half-Bog soils
9. Oxisol	ox	F. <i>oxide</i> , oxide	Oxide soils	Laterite soils, Latosols
10. Histosol	ist	G. <i>histos</i> , tissue	Tissue (organic) soils	Bog soils

coined syllables without any previous meaning were chosen.

### For Example, Oxisol

There are 10 soil orders, each defined by a few properties that distinguish one from the other, and this distinction is reflected in the name. For example, one of the orders is designated *Oxisol*, of which *ox*, meaning oxide, is the formative syllable combined with *sol*, meaning soil and indicating the name of an order. These are soils containing large amounts of iron and aluminum oxides found in many tropical regions.

The Oxisols are subdivided into suborders according to the kinds of horizons that have been developed in them. The names of suborders are two-syllable words with the first syllable representing a property of the class and the last suggesting the name of the order. For example, *Aquox* means wet soils of gray or bluish colors with large amounts of oxides. The *aqu* comes from the Latin *aqua*, for water, and the *ox* from the order name, Oxisol.

The great groups define the soils more specifically. For example, *Plinthaquox* are soils that have gray surfaces underlain by red and gray layers that are rich in iron oxides and that harden irreversi-

bly into brick-like material on drying. The *Plinth* comes from the Greek *plinthos*, meaning brick.

The subgroups further define the soil with reference to minor presence of properties found in other great groups.

The families are defined primarily by the soil texture, mineralogy, and temperature.

When a soil is completely classified, then, we may end up with a full name such as *clayey kaolin-itic isothermal Typic Plinthaquox*.

This will remain just Greek to most of us, of course, and we will be no worse off because of it. But the name carries a very large amount of information for the soil scientist who must interpret the soil properties in terms of responses to a great variety of uses. The new system should help us bring more precise knowledge to bear on all soils and thereby improve our decisions on the uses of these soils.

—E. JOSEPH LARSON, *Information Division, SCS, Washington, D. C.*

## Yearbook Honors Conservationists

**S**TUDENTS of Canadian, Tex., high, junior high, and elementary schools in the northeast corner of the Panhandle have an

impressive keepsake to remind them of the importance of soil and water conservation and their responsibility in conserving our resources.

The *Beargrass*, student yearbook, is dedicated to "The Conservationists . . . Those Stewards of the Soil . . . who labor daily for posterity with their eyes toward the future." It might be the first school yearbook in the Nation so dedicated.

The theme of a citizen's responsibility toward soil and water conservation runs throughout the book. End pictures and full page pictures setting off each section of the book concern conservation. The prose with each photograph relates to conservation.

The *Beargrass* staff paid special tribute to Don Powell, SCS work unit conservationist of Hemphill County, who not only furnished the photographs for the book but "acted as special adviser to the staff and to our sponsor in planning and editing this book which is dedicated to Soil Conservationists." Thanks were given Raymond Newell who assisted in taking the air photos of conservation practices and aided in preparing the book.

*Beargrass* co-editors were Kay Abraham and Janet Greene.



# Minimum Tillage

The new conservation way to farm saves soil,  
reduces cost of labor and equipment

## For Corn And Soybeans

By William J. Keyes  
*Work Unit Conservationist, SCS,  
Sparta, Ill.*

**M**ORE and more farmers in Randolph County, Ill., Soil and Water Conservation District are spending less and less time on tillage operations for corn and soybeans. Here are some reasons:

Byron Preston of Baldwin says, "It saves time and money. It is my goal to crib 1 bushel of corn a minute spent in raising it."

Ted Guebert of Red Bud says, "I eliminated all that extra work, that costs me money and time, and my yields are just as good."

Eric Kloepper of Prairie says, "It saves time and money. It also cuts down on soil washing because the soil is loose and will absorb more rainfall."

Others say they can get their corn and beans planted and their hay put up without working all day and half the night.

Still others say they want a seed bed for their corn and not a weed bed for annual grasses and weeds, which they later have to cultivate out or spray to kill.

### Two Systems

Two systems are in use on silt loam soils in this area. One is planting directly in freshly plowed soil, either in tractor wheel tracks or in tracks made by both tractor and carrying wheels of the planter. The other is planting directly

in freshly plowed soil, not in tracks of any kind.

Both 2- and 4-row equipment, mounted and unmounted, are being used with equal success. After planting, the normal procedure is to rotary hoe once or cultivate once, depending on rainfall and corn height at time tillage is needed. Unless the farmer has a particularly bad weed problem, the use of preemergent weed chemicals has not been necessary.

Experience since 1956 with the plow-then-plant system as used in the Randolph County district has demonstrated that no special equipment is needed. Implements available on the farm are used. However, depth shoes on planter runners are necessary to help firm the seed bed and assure even depth of planting. This is especially true with soybeans in order not to plant too deeply.

### Guiding Principles

Experience has also taught that the guiding principle in minimum tillage is to place the seed in the moisture zone at the optimum depth with sufficient compaction to assure germination.

With the seed placed in the center of the tracks, compaction by the rear tractor wheels or by the carrying wheels of the planter is sufficient. Where 4- or 6-row equipment is used and the tractor wheels cannot be adjusted to make tracks for each row, additional weight needs to be added to each planting unit. Compaction 3 to 4 inches to each side of the seed is

(Continued to p. 104)

## For Potatoes

By William A. Hayes  
and Clifford Roy

*Agronomist, Upper Darby, Pa., and  
Soil Conservationist, SCS, Ft. Kent,  
Maine*

**"M**INIMUM tillage saved me \$2,400 on 200 acres of potatoes over the last 2 years, and my yield and quality are just as good as they were under the old costly system of tillage."

Antonio Martin, farmer of Fort Kent, Maine, was telling his experience with minimum tillage. He continued, "Water runoff between potato rows is hardly noticeable—water percolates into the soil."

Also, because of a reduction in the number of operations, Martin uses only two tractors and two hired men under the new system. Under the old conventional system of potato tillage, three tractors and men were needed.

Mr. Martin, a St. John Valley Soil Conservation District cooperator and farmer, operates a 300-acre potato farm in a rotation of 2 years potatoes and 1 year oats. Potato rows are on a 1 to 2 percent grade. They are planted parallel to his diversion terraces which are spaced about 400 feet apart.

### Answer in Aroostook

Erosion on potato fields is an old problem in Aroostook County, and the farmers have fought it for many years. After 2 years of trials on several potato farms it appears that minimum tillage combined with diversion terraces will greatly



reduce soil erosion as well as cut operation costs.

In adapting their farm conservation plans to include minimum tillage, Martin and other potato farmers have had the help of the Soil Conservation Service.

While minimum tillage is not new with many crops in other parts of the country, it is new to Maine potato growers. It shows great promise in reducing erosion and cost of production for many more potato farmers than are yet using it.

Normal tillage operations on this deep, well-drained soil (Plaisted gravelly loam) include fall plowing, 2 harrowings in the spring, and planting. Another trip to apply a preemergence chemical for broadleaf weeds, 2 cultivations, and 1 spading conclude the conventional tillage operation. Then a spray is applied for control of flea beetles. This amounts to 9 trips. From here on the operations are the same for conventional and minimum tillage, 8 to 12 insecticide and fungicide sprays, 1 spray to kill tops, and the last trip for digging.

### First Trips in Spring

Mr. Martin's minimum tillage operation begins with plowing in



A six-pronged tool bar is mounted under the tractor at planting time to accomplish two operations at one trip over the field.

the spring rather than the fall (1st trip). Soon after plowing he plants. When planting, a tool bar is mounted under the tractor and the planter trails behind, planting potatoes and applying a systemic insecticide for flea beetles. A single spring tooth mounted back of each planter wheel erases the wheel track (2d trip). The planting operation is then followed with an application of a preemergence spray for broadleaf weeds (3d trip). The tillage operations are concluded with a modified tool bar mounted under the tractor and spades on the rear—cultivating and hilling in one operation (4th trip).



Rear view of planter shows rough, loose surface of soil and elimination of wheel tracks by spring tooth back of each wheel.

Up to this point the minimum tillage operation includes only four trips while the conventional operation requires nine trips—or a saving of five trips. The five trips represent a savings of about \$6 an acre.

The real payoff, however, is that after severe storms there is little evidence of erosion on fields where minimum tillage is used. Fields of similar soils and slopes where conventional tillage is used show considerable rilling and soil deposition in diversions and waterways.

## Corn, soybeans

*(Continued from p. 103)*

all that is necessary. Compaction between the rows benefits the weeds, not corn and soybeans.

There are many reasons for using adapted methods of minimum tillage on all crops. The savings in hours of labor and equipment operation reduce production costs and make possible better use of available labor on the farm.

Soil and water conservation advantages may well be of greater importance than economy of operation. Less compaction of the soil and rough surfaces make for greater absorption of rainfall, less surface runoff, greater protection from water and wind erosion, and reduced weed growth.



Six weeks after planting with minimum tillage, potatoes on the Antonio Martin farm are off to a good start. The rows are on 1 to 2 percent grade between diversions.



## Plow-Planting For Fewest Trips

ONE of the hardest jobs for a farmer who practices minimum tillage is to sit and wait when his neighbors begin to plow early, says Louis Risser, Jr., of Pandora, Ohio. But patience pays off.

By minimum tillage, Mr. Risser and his one hired man have been able to grow 300 acres of sugar beets, tomatoes, corn, and soybeans each year. At the same time the family's net income has steadily increased.

The practice is a part of his soil conservation plan as a cooperator with the Putnam Soil and Water Conservation District since 1956. His goal is a minimum number of trips across the fields with tractors to prevent soil compaction. In 1963 he started plow-planting.

### Good Job of Plowing

"A man needs to do a good job of plowing to plow-plant successfully," Mr. Risser says. "He also needs a large plow that won't slow down the planting operations too much."

Mr. Risser built a tandem tractor hitch so he could pull his 6-bottom 16-inch plow. By using dual tires on the rear wheels, he was able to keep the tractor wheels out of the furrow, eliminating compaction of the plow sole. Leveling teeth added to the moldboard smooths the ground enough for planting.

Mr. Risser applies herbicide, insecticide, fertilizer, and seed in one operation.

During June of 1963 the Risser farm got 2 inches of rain in 1½ hours and had very little runoff. Another half inch fell earlier in the day. Risser credits this reserve with carrying his crops through an extremely dry summer.

"I can increase my profits by cutting production costs even if my yields don't increase," he explains.

Reduction in soil compaction along with the practice of plowing down rye or ryegrass have improved tilth of the soil. The cover crop is seeded by an airplane which saves a trip across the field, thus reducing soil compaction still more.

"I have been able to plow deeper with the same power, which proves my soil is working easier. I believe plow-planting is here to stay."—JOHN BATTLES, *Work Unit Conservationist, SCS, Ottawa, Ohio.*

## Chisel Plow Reduces Erosion

THE father-and-son team of Marmion and Dave Adams plow, plant, and fertilize at one operation with their system of reduced tillage for corn and soybeans on their Iowa farm.

They pull a 4-row planter behind a 14-foot chisel. While one operates the chisel the other keeps fertilizer and seed in the planter.

Marmion Adams explains that they started minimum tillage on the recommendation of the Soil Conservation Service when they prepared their conservation plan with the Boone County Soil Conservation District:

"When we changed from dairy farming to grain farming 4 years ago, we soon found we had difficulty in doing all the plowing, seedbed preparation, and planting for 550 acres of corn and soybeans. We also found water and wind erosion increased when we changed from corn-corn-oats-meadow to a corn-beans-corn-oats (sweet clover, green manure) rotation," he recalls.

In the fall the cornstalks are chopped and the soil is disked and chiseled. The fields are chiseled again in the spring, then chiseled again and planted in a final operation. A rotary hoe is used once, followed by chemicals if necessary to control weeds. Sloping fields are worked on the contour.

"I'm really sold on chiseling to control water erosion," says Mr.

Adams. "With terraces and chiseling we get very little runoff on our sloping fields. On the flat uplands we get better drainage into our tile system. This means we can get into the fields earlier in the spring. In dry periods, we also find more moisture where we chiseled."—ROBERT V. BOLLMAN AND ERNEST E. BEHN, *Conservation Agronomist, Des Moines, and Work Unit Conservationist, SCS, Boone, Iowa.*

## A Half Century Of Stripcropping

A half century of stripcropping as part of a soil-protecting program has helped make the 76-acre Manderfeld farm of Genessee, Idaho, an economic success.

This conservation saga began in the spring of 1908 when Hubert Manderfeld purchased the cropland and immediately seeded 40 acres to alfalfa which fed the livestock that later became the major source of income.

The land and the livestock have sustained the Manderfeld family, even during the difficult years, and paid for the farm twice in the past 56 years.

The stripcropping system was laid out in three fields about 450 feet wide. There was no crop grown that left the soil exposed in the winter when erosion is most active in this area. Over the years about two-thirds of this farm was in alfalfa or grass for pasture and the remaining acres were used for barley, corn, and vegetables.

Recently the farm was granted a wheat allotment of 11.9 acres a year. A 3-year rotation will be applied consisting of winter wheat the first year, barley with alfalfa and grass the second year, and green manure the third.

The farm will remain in the stripcropping system that was laid out in 1908.—LAWRENCE W. SORENSEN, *Soil Conservation Aid, Soil Conservation Service, Genessee, Idaho.*



# New Grasses for the Southeast

**SCS plant materials centers turn to natives  
to find adapted range forage species**

By **W. C. Young and H. L. Leithead**  
*Plant Materials Specialist and Range Conservationist,  
SCS, Ft. Worth, Tex.*

**E**XTENSIVE studies of native forage grasses by SCS scientists in the Southeastern United States are providing the means to develop sound range management for the beef industry in this region.

The studies, conducted at SCS Plant Materials Centers, are adding to knowledge about plants that are adapted to Southeast rangelands. The centers are located at Arcadia, Fla.; Americus, Ga.; and Coffeeville, Miss.

More than 76 million acres of land in the Southeastern States has grazing potential. Most of it has been grazed many years without concern for developing or improving the grass cover.

To develop an effective range conservation program for this area, more information about grasses adapted to the Southeastern States

is required. There is need to know how different forage plants respond to use, when they produce seed and of what quality it is, and how winter hardy they are. Little is known about the growing habits of most of the important range plants of the Southeast.

## Natives Preferred

Studies of range plants in the Western States have shown that plants native to a region are usually best for establishing grass stands. Plant Materials Center work in the Southeast has shown that the more prominent varieties of the western range plants are not adapted to the Southeast.

The centers are, therefore, turning to native grasses of the area as a source of suitable range plants. Because of lack of information

about seeding habits, most of the plants studied at the centers have been transplanted from the wild.

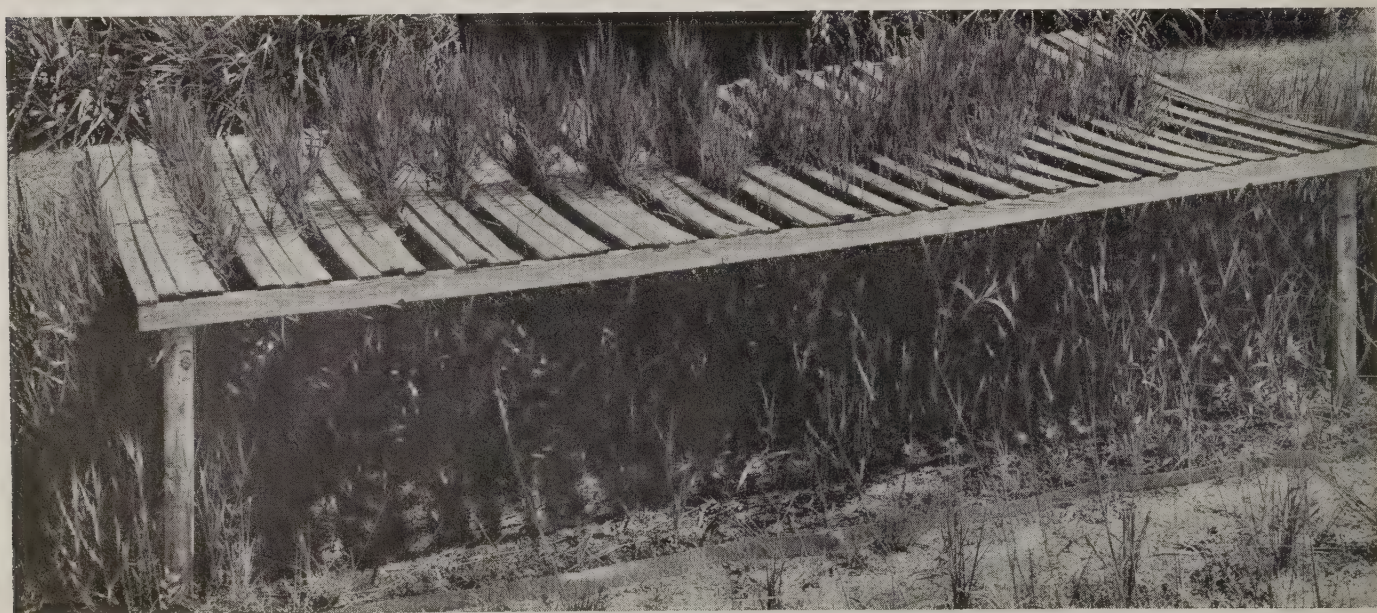
Among the more promising southeastern range grasses are the native switchgrasses which have been assembled and are being evaluated toward selection of an adapted variety. Pangburn switchgrass is proving valuable in many parts of the Southeast. Studies of this grass are continuing.

Progress is encouraging also with little bluestem as the source of an adapted grass for the Southeast.

At the Americus Plant Materials Center, switchgrass produced very early spring growth. It was 2 to 4 weeks ahead of the cultivated summer species like bermudagrass and bahiagrass. Frequently, it was 6 inches to a foot tall before the normal summer pasture plants began to green up.

## Winter-Green

The native switchgrasses of the Florida peninsula retained green foliage throughout the entire winter at Arcadia. In some years these grasses, which are normally considered summer-growing plants, make some growth during the winter months. Winter forage is one

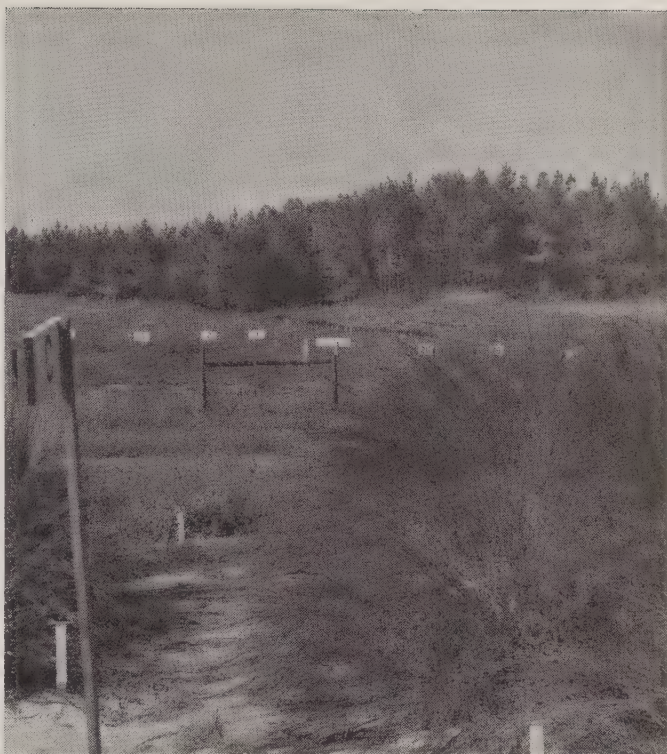


Blue maidencane on wet site on the Plant Materials Center, Arcadia, Fla., demonstrates the ability of this grass to grow in shade. The left of the canopy gives the plot 75 percent shade, the right half 50 percent.





Pangburn switchgrass, in the Coffeerville, Miss., center, makes large amounts of dry forage and recovers rapidly after cutting.



Two-year-old little bluestem in rod-rows at Coffeerville shows this to be a fast-growing species easily propagated from seed.

of the primary needs of an adequate year-long grazing program in peninsular Florida. With proper range management these Georgia and Florida grasses might provide the native pasture needed in these States.

Blue maidencane, an important grass species in the wetter areas of Florida, also has been found to be one of the more shade-tolerant grasses in the South. Blue maidencane grew normally at Arcadia under 75 percent shade.

Creeping bluestem, grown from underground rhizomes, is being studied at the Arcadia Center. This species produces very few seed, but if managed properly the plant thrives because of its extensive rhizomes.

Creeping bluestem has been transplanted into both the Americus and Coffeerville Centers to test its winter hardiness and adaptability. It withstood the winter of 1963-64 at Coffeerville, which was one of the colder winters on record there.

## Wind Erosion Control Guides

*Curves adapt basic research to show soil loss rates for Great Plains cropland*

By J. W. Turelle

*Agronomist, Regional Technical Service Center, SCS, Portland, Oreg.*

**“W**IND erosion curves” plotted by Soil Conservation Service specialists enable soil conservationists assisting farmers and ranchers to plan more specifically and accurately for wind erosion control.

With these curves conservationists can estimate potential soil losses by wind on a particular field and suggest alternative land treatments to reduce average losses to a certain level. The maximum rate considered tolerable in the Great Plains is 5 tons per acre per year. Any planned land treatment that indicates an annual soil loss greater than 5 tons per acre is not ac-

ceptable.

Holding the soil loss to this level generally will allow an adequate soil depth for lasting crop production, avoid wind erosion damage to buildings and other structures, permit maintenance of the original soil texture, and reduce the possibility of small grain loss in the seedling and stooling stages by wind blasts.

### ARS Equation

The author and D. C. Craig, SCS agronomist for the southern Great Plains, plotted the wind erosion curves from data calculated from an equation developed by the Ag-



gricultural Research Service. Separate curves for ridged and unridged surfaces were entered upon charts for ready reference by field personnel.

Many curves are plotted for the Great Plains States, but each work unit receives only those curve sheets applicable to the climate and soil types in that location. Each sheet covers one or more wind erodibility groups of soils.

The basic equation is  $E=IKCLV$ . It was solved for all known field conditions in the Great Plains States.

$E$  is the potential annual average soil loss in tons per acre. This loss is found by considering the erodibility of the soil by wind ( $I$ ), the surface roughness provided by ridges ( $K$ ), the climatic factor of a given area ( $C$ ), the unsheltered distance along the prevailing wind erosion direction ( $L$ ), and the effectiveness of different kinds and amounts of vegetation or residue ( $V$ ).

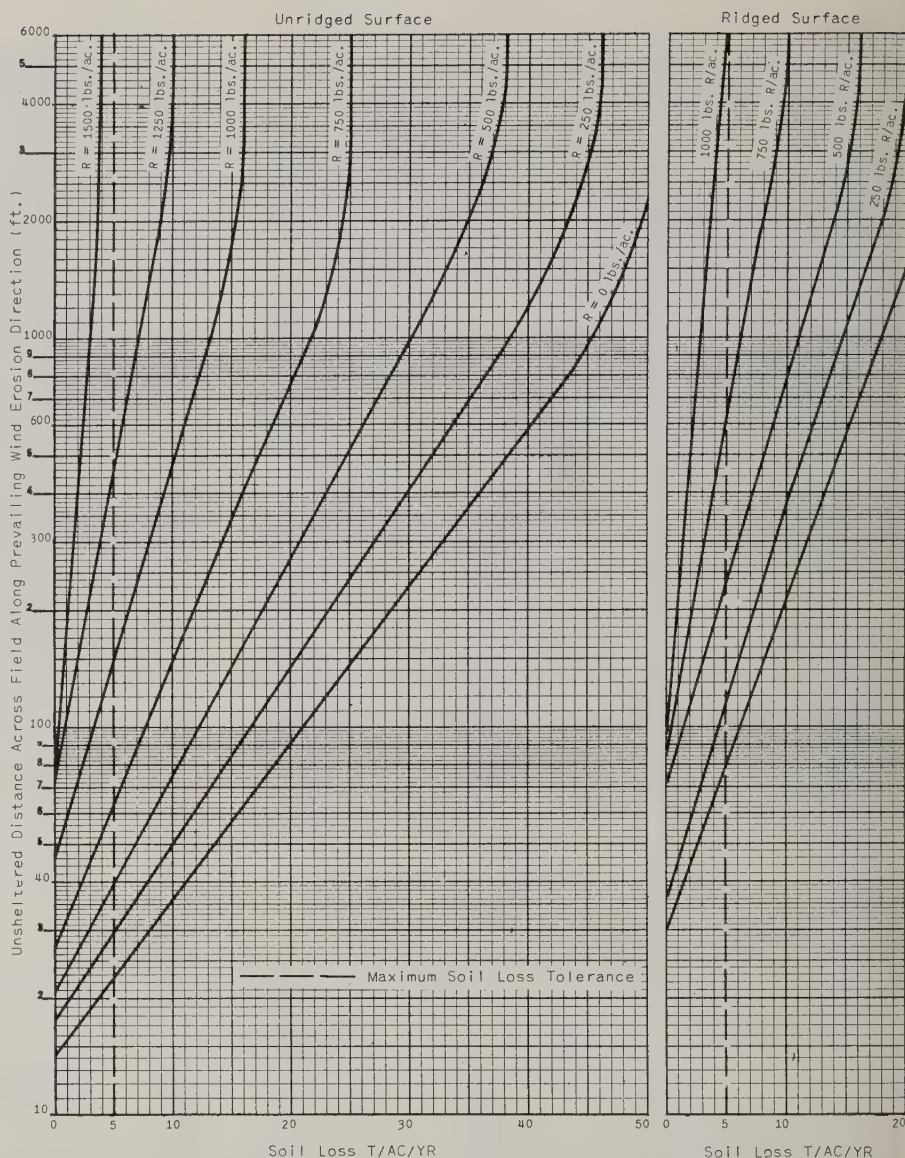
The climatic factors are expressed in percentages of the climatic value of 100 percent assigned to Garden City, Kans., the base location chosen for this condition.

## How They Work

How the charts are used can be illustrated with the example shown on this page.

Assuming an unsheltered distance ( $L$ ) of 660 feet along the prevailing wind erosion direction and 500 pounds of residue per acre, the average annual soil loss under the conditions represented is found by first locating 660 feet on the vertical scale at the left of the chart, then moving along the 660-ft. line to its intersection with the "R" curve of 500 pounds per acre, and from this point downward to the bottom line. There the soil loss is found to be 27 tons per acre per year.

This amount exceeds the maximum tolerable soil loss. Therefore, the soil conservationist must offer



This example of the wind erosion charts provided to SCS work units in the Great Plains gives curves for sandy loam and clay soils in an area with a climatic factor ( $C$ ) of 60 percent and fields having flat small grain residue ( $R$ ) from a previous crop. The user can read across the bottom of the chart the soil loss in tons per acre per year for the unsheltered distances shown along the left side of the chart.

alternative land treatments to reduce the loss to less than 5 tons per acre per year.

Several alternative land treatments are possible to avoid excessive soil loss. Two examples might be: (1) To increase the amount of surface residue, or (2) to reduce the width of the unsheltered field.

To determine the residue required for the first treatment, locate the distance ( $L$ ) of 660 feet in the vertical scale of the chart. The intersection of this line with

the vertical dash line (5 tons soil loss) falls between the curves  $R=1,500$  pounds/acre and  $R=1,250$  pounds/acre at approximately 1,300 pounds per acre. Thus, 1,300 pounds of surface residue would permit an unsheltered field width up to 660 feet with annual soil loss of less than 5 tons per acre.

For the other alternative, assuming a residue cover of 1,000 pounds per acre, the maximum allowable field width is determined by locating the point where the curve for



R=1,000 pounds/acre intersects the vertical dash line representing 5 tons of soil loss per acre. The horizontal line at this point reads 155 feet on the vertical scale. Thus, the field can be no more than 155 feet wide to assure desired protection from wind erosion.

Similar charts are available for the combinations of conditions found in each soil conservation district in the Great Plains.

## Rate of Practice Application Gains In Great Plains

Establishment of conservation practices with cost-sharing under the Great Plains Conservation Program moved forward at an accelerated pace in fiscal year 1964, the annual summary of SCS field office reports shows.

The major practices showed increases in the range of 10 to 35 percent over corresponding accomplishments in fiscal 1963. The total amount of cost-shares paid was \$8,951,720, a 26 percent increase over the \$7,069,570 in 1963.

Establishment of permanent vegetative cover continued to be the most important practice in the program, accounting for \$1,559,798 of the cost-shares paid. Participants established 176,984 acres of new vegetation under this practice, compared to 151,033 acres in 1963, a gain of 16 percent. They also reestablished 8,672 acres.

Controlling competing shrubs earned the second largest amount of cost-shares, \$1,037,588, and was newly applied on 449,584 acres, an increase of 22 percent over 1963.

Notable increases were recorded in new establishment of the following practices: Reorganizing 446 irrigation systems, 66 percent over 1963; establishing 2,864 acres of permanent sod waterways, 54 percent; 1,463 wells for livestock water, 35 percent; and 1,950 dams and pits for improvement of vegetative cover, 35 percent.

# Soil Survey Use in Iowa

**Crop yield data help farmers, tax assessors benefit from maps covering all counties**

By **W. D. Shrader and F. F. Riecken**

*Department of Agronomy, Iowa State University, Ames, Iowa.*

**W**ITH the completion in 1964 of field mapping in Keokuk County, Iowa, soil surveys became available for all the 99 counties in the State.

The soil surveys, used in conjunction with information being gathered on crop yields and economic returns from specific kinds of soil, are widely used for many purposes besides farm planning in soil conservation districts. Public and service organizations and businesses using the surveys include lending agencies, fertilizer companies, tax assessment bodies, and zoning and planning boards.

A comprehensive program was initiated in Iowa in 1957 to gather crop yield information on a large variety of soils. The Agricultural Experiment Station, the Soil Conservation Service, and the Extension Service are cooperating in the study, under the general direction of Dr. Lloyd Dumenil of the Department of Agronomy.

### Random Plot Yields

On a number of randomly selected plots in farmer fields, corn is harvested by hand and yields determined each year the plot is in corn. A careful record is obtained of soil treatments and crop management practices used; detailed soil profile descriptions are written and soil tests performed; and rainfall records kept. About 20 plots in 15 counties are harvested each year.

Although about 10 years of records are needed for a thorough analysis, the information already

is being used in county extension education and soil conservation planning programs. These studies showed, for example, that on many farms too low stands of corn were limiting yields and response to added fertility.

### Guide for Assessors

One of the more challenging uses of county soil surveys in Iowa is that of aiding county assessors in valuing agricultural land for tax purposes. Taylor County in 1947 was the first to use soil surveys for this purpose. Since then 14 have done so.

In Keokuk County the assessor has obtained a copy of the field sheets of each township as they were completed. The assessor measures the acreage of the different soils of each 40-acre tract. SCS Soil Scientist Robert Jones and Iowa State University Extension Agronomist Joe Phillips have prepared a productivity rating of each soil mapped. The assessor makes an economic rating of each soil and this becomes an important starting point in determining the assessment value of each tract.

A number of assessors have considered the use of soil surveys so important that financial contributions have been made to the Soil Conservation Service and the Iowa Agricultural Experiment Station to speed the completion of their standard soil surveys.

The first county soil map in Iowa was made in Bremer County in 1914. The early maps were great innovations but now seem primi-



tive by present standards. Like roads, schools, and cities they need renewal. At present, field maps which are completed or in process of completion in only 30 of the 99 counties are considered to be satisfactory for present-day needs.

### Keokuk County Survey

The Keokuk County survey, like other recent ones, was made on aerial photographs on a 4-inch-to-the-mile scale. Some soil delineations are as small as 2 to 3 acres. Detail is sufficient for the maps to be used directly for farm planning.

The survey of this 370,000-acre county required parts of five field seasons by SCS Soil Scientists Allen Hildebaugh, Robert Jones, and Mack Miller. The cost approximated the value of about two average (200-acre) size farms or about 0.1 percent of the value of the farmland. The useful life of the soil map is expected to be at least 20 years.

The value of the soil map is mainly in its use as a basis for organizing knowledge concerning the soils and their uses in the area for making predictions. Among the numerous types of predictions that can be made, those of crop yields are of prime importance in agricultural counties such as Keokuk.

### Base for Predictions

Crop yield predictions are made for each kind of soil shown on the map over a range of definite management systems. They are based on yield records by counties and townships, observations made by the surveyors while in the field, and observations by other skilled men.

Yield records under closely controlled conditions and over a range of treatments on experimental fields, such as are being collected in Iowa and at experiment stations generally, are especially valuable.

Crop yield records for 10 or more years are available from ex-

perimental fields on 16 of the major upland soils in Iowa. Extension of the information to closely similar soils is an important step in preparing predictions for all the soils mapped in a county.

### Transfer of Information

For example, in Keokuk County one of the major soils is Taintor silty clay loam, a soil developed on flat uplands under prairie vegetation. It has no erosion problem but requires tile drainage for best performance. There is no experimental field on the Taintor soil, but there are experimental fields in other counties on Webster soils, which are generally similar but located in a slightly drier and cooler climate. There are also experimental fields on Grundy soils, which are more difficult to drain but are similar to the Taintor soils in several respects.

In experiments on the Webster silty clay loam with the best treatments, average crop yields for the past 6 years have been as follows: Corn 117 bushels an acre, soybeans 36 bushels an acre, oats 75 bushels an acre, and hay 4.0 tons an acre.

On Grundy silty clay loam, comparable yields are: Corn 101 bushels an acre, oats 45 bushels an acre, and hay 3.7 tons an acre.

Weather for this period has been favorable—perhaps above average. This does not invalidate the results, however, for, on the average, the climate for the Taintor silty clay loam soil area is more favorable than for the Webster and Grundy experimental plots.

Yields of small plots have been found to average some 10 to 15 percent above those of ordinary farms, because of the more careful attention possible on experimental plots to obtaining a full stand and harvesting without waste.

So, considering all available data and assuming average weather and the use of the best known production practices, it can be estimated that a farmer using adequately

drained Taintor silty clay loam should have the following average crop yields: Corn 95 bushels an acre, soybeans 35 bushels an acre, oats 65 bushels an acre, and hay 4.0 tons an acre. While individual farmers in some years will obtain yields well above these estimates, average yields have been below these figures.

Because Taintor soils have no erosion hazard, the choices of cropping systems can range from intensive row cropping to rotations including 1 or more years of meadow crops.

Clinton silt loam, 5 to 9 percent slope, moderately eroded, is another important soil in the county. As its name implies, it has an erosion hazard that restricts its suitability for intensive row cropping. The best experimental data available for this soil are on Fayette silt loam at La Crosse, Wis.

But the 16 experiment field sites do not cover all the soil conditions. Therefore, other sources of information must be used or additional data collected. That is the reason for initiating the program of gathering yield information from farm fields in Iowa.



If you get caught out in the field during a thunderstorm, get away from the tractor and lie down. Stay away from fences, lone trees, overhead wires, or highline towers, and stay off the tops of hills.



Snow and ice on farm ponds often can kill fish during the winter months. Because the icy covering seals off the direct oxygen supply from the air, scraping off ice can be of some help.



Leonardo da Vinci, about 5 centuries ago: "He who would lead the world in peace must begin by being a farmer."



Never keep a pesticide in anything but its original container.



# Roadside Beauty and Safety

## Drivers reap benefits of erosion control program on South Carolina highways

By **L. D. Eagles** and **O. S. Kirkpatrick**

*Conservation Agronomist, Columbia, and Area Conservationist, SCS, Florence, S.C.*

**T**HE South Carolina Highway Department is revolutionizing its fight against the twin evils of wind and water erosion that so long have taken their toll on the State's highways.

To speed up the work it recently employed an agronomist, Ross McMillan. The reason: Grass is becoming as important a part in highway construction as cuts and fills, gentle grades, and sweeping curves.

The result is scenic beauty for the motoring millions as well as smooth highways on which motorists can drive in comfort and safety.

Over the years highway departments, in this and other States, gave little attention to the use of vegetation to protect the parts of the rights-of-way not covered with paving, according to District En-

gineer C. D. Campbell of Orangeburg.

### A Better Method

The first step in this direction began when they spread topsoil on denuded areas. They depended on volunteer growth from grass seed and rootstocks in the soil. Results were usually poor.

Two other factors caused the State Highway Department to look for another—and better—method of protecting roadsides. It became more difficult, and more expensive, to get topsoil as land values rose. Also, opposition developed from the State Association of Soil Conservation Districts, other agricultural leaders, and landowners who looked with dismay on the resulting stripped fields which were left exposed to erosion.

A new look in highway engin-

earing began to emerge in the late 1950's when plans were made for the improvement of U.S. Highway 321 in Orangeburg County. District Maintenance Engineer Edgar Caffee and Resident Maintenance Engineer Buck Reames asked the Soil Conservation Service to help them work out an erosion control program for the job. They persuaded State Highway Department people that such protection could be built into the construction plans.

They decided, first of all, that they would make a heavy seeding of Pensacola bahiagrass on the shoulders to eliminate the dangerous dropoffs that had always resulted where erosion cut the soil away from pavement edges. The grass was to be fertilized to get a quick cover and dense sod.

### Farmer's Equipment

Then a hitch developed. The highway department had no grass seeding equipment.

Joe Williamson of Norway, a co-operator with the Orangeburg Soil Conservation District, was one of the men who was promoting better roadside erosion control for highway safety and beauty. He loaned the department his grain drill to make the pilot planting.

The success of the experiment attracted wide attention among



Roadcuts are sediment sources and eyesores until covered with mulch or vegetation to protect them from erosion.



*Sericea lespedeza* securely carpets this roadbank, providing wildlife cover and food and pleasing the human eye.





**An asphalt mulch applied to a reshaped roadbank protects it from erosion and holds seed in place until grass is established.**

road officials. Last fall Engineer Reames harvested bahiagrass seed from that section of highway for use on other roads in his area.

Now, similar work is going on in each of the seven highway districts in the State, and county commissioners are beginning to add such improvements on the roads under their supervision. The SCS continues to be an important member of these teams. Landowners cooperate, too. Their conservation farm plans include water disposal systems that direct water away from unprotected roads and highways.

Roadside treatment for onsite benefits, as well as reduction of sediment that clogs road and farm ditches, stream ponds, and even the State's great harbors, is now a project commanding widespread support.

### **Program Extended**

Recently the State Highway Department, soil conservation district supervisors, Clemson College, and the SCS initiated a program to

emphasize erosion control on public roads. Problem areas throughout the State have been selected

for study. New treatment methods are being devised, and various plants are being studied. The highway department's agronomist will help to carry new methods into all parts of the State.

The State legislature has noted the progress of this work, and in 1962 passed a resolution commending the highway department for the erosion control work being carried on in cooperation with the SCS.

The interstate highway program, now about half completed in South Carolina, has given impetus to erosion control and beautification of rights-of-way.

Already there are several hundred miles of highways where shoulders, fills, cuts, and medians are stabilized with a beautiful green covering of vegetation.

And what's more, the pattern set for construction of all new highways is being adopted for remodeling of the old. One of the last major sources of sediment and fast runoff of floodwater is being brought under control.



**Farm equipment is used to seed grass on reshaped road shoulders, which will provide a safe place for cars to leave the highway.**



# Mechanical Sodding Method Solves Waterway Problem

By **Larry H. Long**

*Work Unit Conservationist, SCS, Presque Isle, Maine*

**W**ATERWAY establishment is a peculiarly difficult problem in Maine's Central Aroostook County where potatoes are grown in rotation with peas and oats. Because the topography is rolling and slopes average 4 to 8 percent, the cropland is generally protected by a system of diversions and waterways. The waterways, however, all too often fail before a good grass cover can be established.

A new technique for direct placement of live sod in waterways now promises to solve the problem. It all came about because George Ritchie, a Soil Conserva-

tion Service technician, noticed that the Central Aroostook Soil and Water Conservation District's landscraper, used to fill wet holes, stripped sod with ease and transported the pieces intact.

He reasoned that the same process could be used to sod waterways. Working with Central Aroostook farmers and district employees, he developed and streamlined the technique. This is how it works:

## **With Landscraper**

First, a gullied waterway is filled by the landscraper and shaped to the desired cross section.

The scraper has 2½-cubic-yard

bucket capacity and is pulled by a 3-plow tractor. It cuts down the sides of the waterway and carries excess earth to low places, leaving no spoil ridge to block drainage from the field, as often happens when graders are used. The scraper builds about 80 feet of waterway in an hour.

The scraper is then used to cut and place the sod. It cuts a strip of sod 4 feet wide, 6 feet long, and 4 inches thick, weighing about 600 pounds. Sod pieces are placed in the waterway, which has been cut below grade to allow for their thickness. On each trip, the scraper is alined with the ditch and the previously placed sod. The bucket is dumped as the scraper is moved backward. All hand labor is eliminated.

## **Instant Protection**

The sod's weight and its 4 inches of topsoil assure its permanence as a healthy protective grass cover.



Ritchie shows depth of waterway after sod is in place. Slopes on either side of sod are seeded to grass.





Scraper cuts a strip of sod 4 feet wide, 6 feet long, and 4 inches thick. George Ritchie, who developed technique, and Clyde Buck, Central Aroostook Soil and Water Conservation District employee, inspect the strip of sod.



Scraper is backed up to place sod in waterway after being aligned with ditch and previously placed sod.

This mechanical sodding has extended the waterway construction period from early spring until snow covers the ground.

The scraper cuts and blends the sides of the waterway into the sod-covered bottom of the ditch. The tractor tire is rolled over the edge

of the sod to ensure a smooth blending with the soil.

The sides of the ditch are harrowed; the entire waterway limed and fertilized; and the sides seeded to a grass mixture.

The same technique is used in sodding a newly built waterway as in shaping and sodding a gullied site.

Equipment costs for sodding average 15 cents a square yard. The travel distance to a source of sod is the principal cost factor.

Since the cost of the new method averages less than \$750 an acre compared to \$5,000 for conventional sodding operations in the State, the Agricultural Stabilization and Conservation Service has been able to reduce ACP sodding incentive payments by 300 percent.

The Central Aroostook district has two scrapers which are fully engaged in sodding operations. More than 100 critical waterways have been sodded.

## Reservoirs Bring Multiple Benefits

Many reservoirs built through the Small Watershed Program are bringing multiple benefits to areas with chronic water problems. For example, 81 reservoirs in 59 watershed projects have been designed for both flood prevention and municipal water supply. These reservoirs will supply water to almost half a million people in 79 cities and towns in 21 States. Several communities have already attracted new industry because of flood protection and plentiful water.

## Conservation Equipment

Some 96,000 pieces of equipment valued at more than \$1 billion use an estimated \$41 billion worth of fuel, oil, grease, and tires in installing soil and water conservation practices on U.S. farm and ranch lands each year.



# Sinkhole Ponds Provide Water in Limestone Area

**F**ARMERS in Giles County, Va., are solving a water shortage problem by waterproofing pasture sinkholes so they will hold water for their grazing livestock.

Water-storage problems in Giles County are as old as the famous caves of the limestone Appalachian Mountains. Most of the land leaks like a sieve. The soft, open-stratum rock has too many cracks and caves to hold water on the surface. Springs are plentiful in the mountains but rare in the grassland below. Mountain streams yield a generous supply of water but are not handy to most farms. Well digging is impractical in most of the area.

Sinkholes are a trademark of the area. When the soft, subterranean limestone crumbles into open spaces below, the land above drops. Dips or "salad bowl" depressions form on the land.

Frank Ferrier, Clover Hollow farmer and Skyline Soil Conservation District cooperator, had this water storage problem on most of his 526-acre farm.

"Most of my upland pastures were 2½ miles from water," says Ferrier. "Cattle lose too many pounds of beef going that far."

SCS Technician John Mustard, Giles County, had worked out the sinkhole pond idea on paper but it hadn't been tried on the land. Ferrier, anxious to have stock water, decided the idea was good and asked Mustard to design a sinkhole pond for his land.

Mustard surveyed the site, checked the soils, and drew up a design for the pond. Ferrier hired a contractor and started the job.

A circular area 70 feet wide and 4 feet deep, with side slopes of 4:1, was dug out of the sinkhole. Some of the fill from the hole was used to build up a low area next to

the pondsite to keep it from being too wet later.

About 300 cubic yards of clay backfill was hauled from a nearby borrow pit and used to line the depression 12 inches deep up to the proposed waterline. Waterproofing chemical tripolyphosphate was mixed into the clay fill 1 lb. to 20 square feet).

The clay fill was sprinkled until well dampened, and the clay soil area then was well compacted by truck or tractor circling it. Finally, the raw or new earth outside the pond was fertilized and seeded with Kentucky 31 fescue.

A sinkhole pond takes about 3 days to build. If the farmer has a front-end loader attachment on a tractor, a truck to haul the fill, and some watering equipment to sprinkle the site, he can do all or most of the job himself. If a contractor does it, an average size pond should cost about \$300. Giles County Agricultural Conservation Program offers cost-share aid for sinkhole ponds just as most counties do on any pond construction.

The watershed for a good sink-

hole pond should be at least 4 acres, Mustard says. That will keep a pool filled with more than a million gallons of water. Also, the foundation must be strong enough to support the weight of the water. The crumbling limestone substratum that creates the sinkhole sometimes makes a pond impractical.

Ferrier, enthusiastic over the results of his first sinkhole pond, has added a second and plans to build a third one soon.

"The ponds have more than paid for themselves with added pounds of beef and better pasture management," he claims.

One side of the basin of a new sinkhole was too steep even for grazing, so Ferrier fenced an acre of the land and planted pines, oaks, and sericea and bicolor lespedeza. The vegetation protects the steep land from erosion and gives wildlife a nesting area. The Ferriers have seen grouse using the area already. The pond also has been stocked with bass and bluegill to make some good fishing for the Ferriers.

More than a dozen sinkhole ponds have been built by Giles County farmers, Mustard reports. And more are planned. Neighboring counties and States with the same problem are starting to build sinkhole impoundments.



The sinkhole pond, one of two Frank Ferrier (r.) built on his 526-acre beef cattle farm, was designed by SCS Technician John Mustard.



# Nursery Alternates Trees and Cattle in Same Fields

**Y**OU wouldn't expect a herd of Angus cows in a big commercial nursery, but that is just what you find on the grassy slopes of the Forrest Keeling Nursery at Elsberry, Mo.

Fields not covered by seedlings of sweetgum, pine, holly, juniper, spruce, forsythia, and a multitude of other trees and shrubs are seeded to grass and legumes—smooth brome grass, alfalfa, and tall fescue—and used for pasture.

Operator of the nursery, Hugh Steavenson, and his assistant, Wayne Lovelace, contend good pastures are merely part of a well-planned nursery operation.

They assert the pasture program is building the soil for growing nursery stock as well as providing ample pasture during droughts such as the one last year.

In the warm seasons on one side of a fence a person might see much color from the flowering trees and shrubs. On the other side, black cows and their calves graze contentedly in green pastures.

Any cattleman, with an eye for winter condition of cattle, would be impressed with the good condition of the stock on the well-managed grass-alfalfa mixtures.

Working closely with the Lincoln County Soil Conservation District and SCS conservationists, the nursery operators have developed a conservation plan which permits growing trees and cattle alternately in the same fields.—WILLIAM H. BILLINGS AND B. H. ROUNTREE, *Plant Materials Center Manager and Plant Materials Specialist, SCS, Elsberry, Mo.*

**Aerial view shows young nursery stock being grown on the contour, a grassed waterway, and farm ponds for irrigation.**

**Black Angus cattle graze on a well managed tall fescue-alfalfa pasture on the nursery.**

**An improved pasture and pond are above a diversion terrace, and contour nursery plantings with grassed waterways are below.**





# Monterey Pines Make Good Christmas Trees

By **Clark L. Moore**

Work Unit Conservationist, SCS, Santa Maria, Calif.

**G**ROWING Monterey pines for Christmas trees gives the small operator, near Arroyo Grande, Calif., another crop to increase his income.

These trees can be grown on light sandy soils, according to Ben Miller, pioneer grower and president of Tri-counties Christmas Tree Growers Association and co-operator with the Arroyo Grande Soil Conservation District.

## Best Species

Clayton Conrow, another cooperator who pioneered the Christmas tree business with a planting of Aleppo pine in 1955, found Monterey pine the best species. Other species like white and Douglas fir, beach pine, coastal redwoods, and Arizona cypress were tried, but now 90 percent of the Christmas trees grown in the Arroyo Grande

district are Monterey pine.

Monterey pine grows much faster than the others, and both Miller and Conrow found that trees planted 5 by 5 feet give about the right spacing to develop well-shaped trees 5 to 6 feet high in 4 to 6 years. These trees can be pruned and shaped to get the kind of trees the public demands, and they sell for \$3 to \$4 a tree at the field. Some trees bring as much as \$8 when sold as potted live trees.

To get a well-shaped marketable Christmas tree, the kind that sells first, Miller stresses the importance of good seedlings, and he produces his own planting stock. He transplants the young seedlings to gallon cans after the roots have been established; when they are 1-1½ years old, he plants them in the field, usually in January.

Miller as well as other Arroyo

Grande district growers, with technical help from the Soil Conservation Service, county agricultural adviser, and State Forester, found that irrigation the first year insures greater survival and a hardier tree. Cultivation keeps weeds down and conserves moisture. A (24-24-12) complete fertilizer is sprayed on after each irrigation at the rate of one tablespoon per gallon of water. An insecticide is added to the fertilizer solution to control mites.

## Income Grows

Annual financial returns to the growers have steadily increased since 1957 when Clayton Conrow sold 50 trees for \$200. In 1963, the Arroyo Grande group, which includes also Bud Schilling, Florian Marsalek, Gudrun Grell, G. W. Howland, and Leo Cottle, marketed more than 3,000 trees for about \$10,000. They expect to market 10,000 trees in 1964 for about \$35,000.

Ben Miller says 30,000 trees will not be enough to meet the local demand. People from as far away as Los Angeles have come year after year to select their trees from Arroyo Grande growers.

Family selection and cutting of the trees in the field is encouraged. This saves much of the marketing expense, and people enjoy selecting their Christmas trees.

## Water Systems for Rural People

Newly constructed or improved water distribution systems installed with loans through the Farmers Home Administration will supply more than 150 million gallons of water monthly to 180,000 rural people, many living in out-of-the-way communities. Heretofore, these people had to haul water for household use or depend on inadequate and often polluted wells. Now they will drink safe, piped-in water. SCS provided technical assistance for many of the installations.



Ben Miller's Monterey pines are planted on the contour. Here he prunes 4½-year old trees to shape them for Christmas trees.





**FARMER'S WORLD: The Yearbook of Agriculture, 1964: U. S. Dept. Agr., Washington, 592 pp. \$3.**

This newest yearbook of the Department of Agriculture is a truly international edition and should have rather wide international sales. It is a *must* book for all Americans concerned with any phase of foreign agriculture or foreign agricultural trade.

The first half of the book gives a brief, but adequate, history of world agriculture, from its beginnings to the 20th century. It continues with a rather comprehensive survey of world agriculture of the present, with special emphasis on production, marketing, and consumption of most crops that have any international significance, from pepper and vanilla to cotton, corn, and beef. Then a section is devoted to international trade, particularly agricultural trade.

The last half of the book deals mainly with the role of American agriculture in the world economy. It gives a rather full discussion of our agricultural trade policies and of our agricultural exports and imports. One of the most comprehensive and clearest discussions I have seen on our rather tangled international agreements relating to agricultural trade is summarized in one section of 125 pages.

Our foreign aid program, particularly as it relates to agricultural programs in underdeveloped countries, is discussed.

Final section is devoted to world agricultural needs, with emphasis on how American agriculture can help solve the many problems, and, in doing so, help solve many of our own farm problems.—TOM DALE, *Former Editor of Soil Conservationist*.

## New Publications

**Forage and Cattle Management in Longleaf-slash Pine Forests. BY L. K. HALLS, R. H. HUGHES, R. S. RUMMELL, AND B. L. SOUTHWELL. 1964. U. S. Dept. Agr. Farmers' Bul. 2199. 25 pp., illus.** In addition to forage and cattle management information, costs and returns and summary of recommendations are given.

**Soil and Water Conservation Activities for Boy Scouts. BY ALBERT B.**

**FOSTER AND ADRIAN C. FOX. Rev. 1964. U. S. Dept. Agr. PA-348. 30 pp., illus.** Twenty-two conservation activities are listed for use in the Boy Scout year-round program.

**Rural Residential Recreation Subdivisions Serving the Washington, D. C. Area, 1963. BY HUGH A. JOHNSON. 1964. U. S. Dept. Agr., Agr. Econ. Rpt. 59.** A study and analysis of 13 rural housing developments built for recreational uses in northwestern Virginia and nearby West Virginia.

## Agronomy, Soil Science Societies Report Conservation Research

The annual meeting of the American Society of Agronomy and the Soil Science Society of America in Kansas City, Mo., November 16 to 20 afforded agronomists and soil scientists an opportunity to report on results of their research projects, and to learn what others are doing in their fields of endeavor.

Nearly 400 papers were given during the meeting. Many of them directly or indirectly have some application to soil and water conservation problems including the Soil Conservation Service's Research Needs Reports.

The 1964 meeting was the 56th for the American Society of Agronomy. The Soil Science Society of

America began in 1936 when the then Soil Survey Association combined with the Section of Soil Science of the Agronomy Society. The two organizations now have a combined membership of about 4,500.

The Soil Science Society traces its origin back to the American Association of Soil Survey Workers, formed in the 1920's and later renamed Soil Survey Association.

The Soil and Water Management and Conservation Section of the Soil Science Society deals with basic and applied research results that are particularly applicable to the soil and water conservation program. Each year some papers are presented by SCS agronomists.

## Land Treatment Gets Emphasis

**R**ESIDENTS of Kent Creek Watershed in Briscoe County, Tex., have done an impressive job in applying land treatment measures within a short period of time.

The watershed work plan was completed in April 1962. Today there are six completed flood prevention structures under Public Law 566, another is in construction stage, and most conservation practices on the 27,000 acres are more than 75 percent complete.

Under sponsorship of the Cap Rock Soil Conservation District and the Kent Creek Water Control and Improvement District, the project is being cost-shared by the Great Plains Conservation Program. It is 75 percent ahead of

the scheduled 5-year installation period of land treatment measures.

In the entire watershed more than 3 million feet of level terraces have been installed, 98.5 percent of the total needed. Contour farming is being applied at a rate of 97.7 percent a year.

Ninety-four percent of all diversions have been applied. Seventy-eight percent of all farm ponds needed have been installed and proper use of 96.1 percent of all grassland is being practiced above the structures.

Eleven other management type conservation practices are being applied at a similar rate of progress.—JOE B. NORRIS, *Range Conservationist, SCS, Lubbock, Tex.*



From the Administrator:

## *Great Society • Technical Guides Keeping Up*

**P**ERHAPS no agency of Government can contribute more to the Great Society through community programs than SCS can. This is so because of the impact our leadership and relations has upon the millions of Americans with whom we deal, directly and indirectly.

Much of what can be done to enhance rural America and alleviate rural poverty is intimately related to the use of our soil and water resources. We have a right to be proud of this contribution. We expect to continue to merit such recognition.

Many changes in the depth and breadth of the conservation movement have occurred this past decade. Perhaps even more changes will occur in the next decade. For example, the size and the makeup of the family farm have been changing rapidly and will no doubt continue to change.

Managing a productive farm is becoming more of a science than an art. The trend toward more highly skilled people in management will probably continue. We, too, will be called upon for increasingly skilled guidance and counsel on conservation matters.

In addition, our contribution must shift more and more to total resource planning as related to the economic impact on communities. Thus we are intensely interested in the broadening and updating of soil and water conservation district programs.

**T**ECHNICAL guides throughout the Service are generally good. Those I have examined indicate constructive thinking by our technical staff.

A technical guide, however, is not a document that can be once done, no matter how well, and continue to be the best guide over a long period of time.

Changes in agriculture are taking place all the time. New machinery is being developed that may require adjustment of conservation practices to make its use practical. New fertilizers make possible the growing of different crops, or different combinations of crops. The application of conservation practices that provide more or less moisture to a given area of land will require adjustments.

We must resist the temptation to consider a well developed technical guide as completed business. The job is never done. Periodic updating is essential to keep them in tune with the times.

Another matter concerning technical guides gives me concern. I have found that in many instances we are considering technical guides as definite standards and are critical of any deviation that a work unit conservationist or other planning technician may make in them.

Technical guides are just what they imply—they are guides. There are many different problems existing within a county or a conservation district, and it is rather impractical to have our guides so complete that they could answer every problem for every acre of land within the area they cover.

This is the reason that we employ technical people to plan and apply conservation practices to the land. If we make our technical guides a standard so rigid that deviation is criticized, we are in effect making robots of our field technicians.

Good, sound, practical soil conservation is not something that can be done by the numbers.

We not only need to encourage our field technicians to recognize a technical guide for what it is, but we also should expect them, with their technical knowledge, to apply the principles contained in the guides to the particular piece of land with which they are working.

**A**NNUAL meetings of professional and scientific societies that follow one another in rapid succession at this time of year remind us of the great variety of subject matter involved in soil and water conservation and of the constant advances that make it an unending effort to stay abreast of the times.

Soil conservationists have the unique need to belong to at least two professional societies. To perform his function of integrating different fields of knowledge into the technology of resource use and conservation, each person needs to belong, first, to the society of his specialty—engineering, agronomy, or whatever—and finally, to our own Soil Conservation Society where we can meet in common forum to unite all disciplines in the service of conservation.

Most dedicated conservationists will also want to participate in some nonprofessional organization of wide public influence, such as the American Forestry Association, Wildlife Federation, Audubon Society, or other group of congenial interest.

—D. A. WILLIAMS



If your address changes, please notify us of your complete new address, including zip code, and include old address with our code number as shown above.

## Grass Improves Highway Scene

Story on page 111



Scenic beauty and safety greet the driver on highways adequately protected from erosion. Bahiagrass

covers open areas of the right-of-way on this section of historic U.S. 1. South Carolina has added an

agronomist to the highway department staff to promote roadside improvement.



1635  
035

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

JAN 7 1965

JANUARY 1965  
VOL. XXX NO. 6

CURRENT SERIAL RECORDS

# Soil Conservation



## RESOURCE CONSERVATION AND DEVELOPMENT

*The Project Approach*  
Page 127

*Ten Pilot Projects*  
Page 129

*Three Examples*  
Pages 123, 126, and 131

SCS PROGRESS, 1964  
Page 133

SOIL  
CONSERVATION  
SERVICE

U. S. DEPARTMENT  
OF AGRICULTURE



# Soil Conservation

## RC&D...

The meaning of an abstract label, such as Resource Conservation and Development, is difficult to grasp at best, and doubly so when reduced to mere initials. But we expect this new alphabetical tag to be as durable in the language of conservation as R&D (Research and Development) in industry. So we invited our Resource Development Division to explain the background and philosophy of the idea (p. 127) and describe the 10 pilot projects (p. 129).

**ABC:** Local initiative is the ABC of RC&D, and early experience shows that private enterprise need not wait for Government help once the potentials are seen. Fieldmen report three exciting examples from Minnesota's vacationland (p. 123), Vermont's White River (p. 126), and the Upper Rio Grande (p. 131).

**ADP:** Automatic data processing makes possible SCS's revised progress and time reporting system. Fieldmen who have worried with the chore of coding and accounting now can take pride in the gains in efficiency resulting from use of the data in our operations. The 1964 summary (p. 133) consistently shows more conservation achieved at lower unit costs.

**Cover:** An infrared photo of East Bethel, Vt., reveals the scenic charm that is a major resource of the White River RC&D Project.



## CONTENTS

### 123 Crow Wing Canoe Trail

Brings new life to Minnesota economy

### 126 Life for White River Area

New businesses open as citizens take stock

*By Eugene C. Hanchett*

### 127 Opportunities in Resource Development

RC&D projects team local leaders, public agencies

*By John W. Barnard*

### 129 First 10 RC&D Projects Show Scope of Activities

### 131 Northern Rio Grande RC&D Project Awakens Area

An alliance for progress

*By Richard B. Bowen*

### 133 Soil and Water Conservation and Resource Development

Summary of SCS Activities for 1964

### 142 Review

Waterfowl Tomorrow; Soil and Water; New Publications

### 143 From the Administrator

Good management

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

Editor  
BEN O. OSBORN

Editorial Assistant  
GEORGIE A. KELLER

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Photos available on request.  
**Commercial names:** Mention of commercial enterprises or brand names does not constitute endorsement by the Department of Agriculture.

**Subscriptions:** \$1.50 per year, \$2.50 foreign. Single copy, 15 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.



# Crow Wing Canoe Trail

## First move in RC&D project brings new life to Minnesota economy

**T**HE people of five Minnesota counties are prodding dormant economic opportunities into life through a Resource Conservation and Development project.

They're working toward more jobs, more trade, and a "flock" of tourists every summer for Swift, Pope, Kandiyohi, and Wadena counties and the eastern portion of Otter Tail County.

A glimmer of things to come is the Crow Wing Canoe Trail in Wadena County, a lively local project that is the first of the 80-odd separate measures in the West Central Minnesota RC&D master plan to reach fruition.

### Accessible Wilderness

The Crow Wing River winds its way through, as a Canoe Trail brochure says, "75 miles of beautiful and accessible wilderness . . . with fish of every variety, sandy beaches for swimming fun, and wildlife galore."

On a total cash outlay of about \$3,000, coupled with a lot of imagination and hard work, the area has been transformed into a vacation haven with land and facilities worth \$180,000.

In a speech dedicating the Canoe Trail June 17, Minnesota Governor Karl Rolvaag called it "one of the most exciting contributions to the art of resource management in our State's history."

The trail starts at Blueberry Lake near Menahga and ends at

McGivern Park near Staples. The river averages about 100 feet wide and 3 feet deep. With a current of about 4 miles an hour, canoeists can make progress even while resting. The usual rate of travel is 20 or 30 miles a day, but four "outfitters" in business on the river will transport vacationers to any starting point and pick them up wherever they desire to stop. The outfitters also can provide any equipment needed.

It hasn't been possible to get a clear idea how many people are using the trail; the canoeing parties are pretty well separated from one another by their differences in rate of progress and bends in the river. But as many as 50 canoes have been counted on the 75-mile course at one time.

### More to Come

Ed Patson, outfitter at Menahga, believes there will be four to five times as much business in 1965.

"Many people came this past year just to try it out," said Patson. "A father and son would take 1 day this time. Next summer they will take 3 days and bring the whole family.

"Counselors for Boy Scouts and Girl Scouts checked it over so they could make plans. All were enthusiastic except four persons who ran into bad weather.

"People like the freedom, the wilderness atmosphere, the variety of bird and animal life."



What's around the bend? Could be a nice beach, swimming hole, or campsite to reward this father and son team on the Crow Wing Canoe Trail (photo courtesy John E. Rife).

Patson rented 20 canoes last year. He thinks he will need 50 this year.

The trail's presence has been felt in the nearby communities, too. Frank Green, a Menahga druggist, reported a run on camera equip-





Dad and the boys take "time out" for a meal of freshly caught fish along the Crow Wing Canoe Trail (photo courtesy John E. Rife).

ment and film. Local grocery stores noticed increased sales to vacationers. And some people have been looking at local property with retirement plans in mind, Green said.

As in other planned projects, most of the ingredients for success were already there—a meandering stream; scenic shores with a suggestion of wilderness; and people who knew and appreciated the aesthetic appeal of their homeland.

Especially, John Rife. Rife provided the spark.

As Outdoor Writer Jim Kimball said in the Minneapolis *Sunday*

*Tribune*: "Every community needs a John Rife. He is a farmer, a soil district supervisor, chairman of the Rural Areas Development program, an insurance man, and above all, a promoter of everything that will benefit Wadena County."

Here's the way Rife describes events leading to development of Wadena's newest tourist attraction:

### Land and People Conference

"It came from the inspiration I got from attending the Duluth Land and People Conference in September of 1963 and hearing

Secretary Orville Freeman's talk. We knew at that time that Federal help would be coming through a resource development project, but we could see no reason we shouldn't begin doing what we could ourselves. The Crow Wing River looked liked the place to start.

"I first contacted the county game manager to find out where all the tax-forfeited land lay along the river. The Wadena Soil and Water Conservation District Board then looked the various areas over and asked the county commissioner to set aside land we had picked out for campsites. Where there was no county land available, we approached other owners. In the end, we got a real good combination of campsites.

### Rod and Gun Clubs Help

"Later we went to each Rod and Gun Club in the towns along the river to see if its members would put some labor into developing the campsites. They were enthusiastic and cooperative as were the literally hundreds of people who helped with the canoe trail in one way or another.

"The next step was to start promotion. To finance a brochure we talked to the Chambers of Commerce and in no time at all had collected a jackpot. With it, we got out an attractive folder. With support of the local papers, Jim Kimball's articles in the *Minneapolis Tribune*, and ads in national magazines, we got wide publicity. Requests for information began to pour in, 6,000 of them in the first 2 months of the summer. In all, we have now distributed 20,000 copies of our brochure to every State in the Union.

"Our last big job was to get wells, fireplaces, and recreational and sanitary facilities at each of the campsites. We made a deal with the State Conservation Department in which we agreed to furnish public access if they would provide picnic tables and toilets. With donated money we bought



the iron for the grills on the fireplaces. Sebeka FFA boys did the welding at nine different sites. Boy Scout troops further developed the campsites. The County Highway Department constructed the access roads."

### Government Too

Many others helped in the project. SCS Work Unit Conservationist Don Benrud provided technical information, including drawings for camp facilities. SCS Biologist Hans Uhlig, RC&D Project Conservationist Bill Oemichen, and Ed Weiland, area game manager for the State's Division of Game and Fish, took an active part. The Minnesota Power and Light Company, the Northwest Paper Company, and cities of Staples and Nimrod all provided some land.

This high level and variety of local contribution and effort is the "proof of the pudding" for the project approach in improved land use and resource development. Authors of the Food and Agriculture Act of 1962 authorizing RC&D projects recognized that the most orderly way to get the job done was through local talent and initiative, with coordination and help

by local, State, and Federal agencies.

Many other projects in the West Central RC&D Project are moving along, too. Some are in Wadena County—the city-owned campground and picnic area at Menahga where 40 acres of jackpine harvest will pay for facilities, and the Sunny Brook park development on 35 acres east of Wadena.

### An Open-End Plan

RC&D Chairman Clint Haroldson, who operates a farm near Willmar in Kandiyohi County, points out that the master plan is "a long-range plan and an 'open-end' one," which means that parts may be added as the work progresses.

There is considerable variation in the land and its needs. Haroldson mentioned the desire of Swift County to expand sugar beet production and refining and plans for a 1,300-acre wetland development for waterfowl.

Pope County has its eyes on redevelopment of Lake Emily for waterfowl and construction of an alfalfa dehydrating plant.

Kandiyohi County is aiming at silt removal from Foot Lake, a recreation lake, a big overland ditch

for flood control, and erosion control through a watershed project.

Wadena and Otter Tail both want a soil fertility study for land management purposes. Otter Tail folks want to give their wood industry a lift and have a plan for a pilot wood products processing plant.

Four counties are trying to accelerate conversion of marginal cropland to other uses. Three have requested accelerated ACP assistance for special purposes.

Price tag on the whole operation for the next 5 years is nearly \$4.5 million. The money will come from many sources—local, State, and Federal. Local residents are hoping to get extra financial help through two recent pieces of legislation, the Minnesota Natural Resources Development Act and the National Land and Water Conservation Fund Act.

Meanwhile, technical assistance is being made available. SCS has allotted \$100,000 for planning and construction operations in the current fiscal year.

As for the people, in the words of Clint Haroldson, "They will continue to do as much as they can with their own abilities. There's no substitute for self help."♦



Improved campsites along the Crow Wing Canoe Trail give family groups like this one a chance to relax and enjoy the solitude of the outdoors (photo courtesy John E. Rife).



# Life for White River Area

## ***New businesses open as citizens take stock in preparing RC&D project plan***

**By Eugene C. Hanchett**

*Project Coordinator, White River Resource Conservation and Development Project SCS, Randolph, Vt.*

**"LOCAL** folks' eyes have been opened to economic opportunities and some have already gotten into action as the result of initial stock-taking for the RC&D Work Plan."

These are the words of Sheldon Dimick, Chairman of the White River Resource Conservation and Development Steering Committee and President of the Randolph National Bank in Vermont.

Dimick's bank is a good example of action already taken. It has opened two new branch offices as a result of the preliminary work done on the RC&D work plan.

"The opportunities for providing more banking services to the people of the area and for establishing the branch banks stuck out like a sore thumb as a result of the initial inventory of the area," said Dimick.

### **Private Enterprises**

Others with typical Yankee business sense saw opportunities for new enterprises as they reviewed

the White River Valley's resources and economic needs in the course of preparing the RC&D project proposal. Among them:

The Dura-belle Manufacturing Company, producer of parquet flooring, has begun operation in an idle building formerly used as a corn-canning factory. When in full operation, the company will employ about 15 people year-round and use about 90,000 board feet of kiln-dried hardwood lumber a month.

Putnam Blodgett of Bradford is constructing a 14-acre lake to provide a boating and swimming facility for a new youth camp with a capacity of about 60. This enterprise will be in addition to his 80-cow dairy farming operation.

George Ainsworth of Sharon has recently converted 5 acres of his 105-acre dairy farm into an overnight trailer park. Within 2 miles of an interchange on new Interstate Highway 89, Mr. Ainsworth expects the trailer park to provide a valuable service to travelers and give him a supplemental income.

Plateau Acres, Inc., of Bradford, a local corporation, has purchased 25 acres of land and is building about 20 new houses. This housing development was stimulated when it became apparent that people wishing to come to Bradford to live or work could not find suitable houses for either rent or purchase.

A corporation known as the Valley Bowling, Inc., consisting of local people, has opened the White River Valley's only bowling establishment.

### **Beginning of an Answer**

These enterprises and others like them are a start toward answering the perplexing problems facing the area in the early 1960's. A decreasing number of dairy farms, idle land, and diminishing population posed a real challenge to the 19,000 inhabitants of the 23 towns of the present RC&D project area.

Local leaders such as Sheldon Dimick and Edson E. Gifford, Sr., chairman of the White River Soil and Water Conservation District Board, busied themselves in making an application for such a project. The application, endorsed by Governor Philip Hoff and approved by the Secretary of Agriculture, resulted in the White River Resource Conservation and Development Project being approved for planning on February 3, 1964.

Project sponsors, the White River Development Corporation and the White River district, and endorsers, the White River Valley Association and the Central Connecticut Valley Association, immediately went to work on the planning phase of the project.

According to Dimick, more than 100 local people, including Federal and State agency representatives working with the SCS project coordinator, were involved in preparing the project work plan. Also, more than 50 meetings were held with local groups, civic clubs, and committees before the plan was completed. ♦



**A manufacturing plant for parquet flooring is in full operation before the project plan is put into effect.**



# Opportunities in Resource Development

## The new RC&D projects team local leaders, public agencies to improve economy

By John W. Barnard

*Resource Development Division, SCS*

**O**F the new opportunities given the Department of Agriculture in the Food and Agriculture Act of 1962, one of the most significant is the responsibility for Resource Conservation and Development projects.

These projects are initiated and sponsored by local people to provide additional economic opportunities through accelerated conservation, development, and multiple use of natural resources. They are self-help projects that will aid materially in making a better life in rural America.

Teamwork between public agencies and local leadership assures success of the projects. Secretary Freeman designated the Soil Conservation Service to administer RC&D project activities. Several other USDA agencies participate according to their normal responsibilities: Farmers Home Administration, Forest Service, Federal Extension Service, Office of Information, Agricultural Stabilization and Conservation Service, Economic Research Service, Office of Rural Areas Development, Farmer Cooperative Service, and Rural Electrification Administration. Other Federal agencies assist as needed.

### Districts Take Lead

Soil and water conservation districts have taken the lead at the local level in developing leadership for RC&D projects. In fact, district governing bodies have been sponsors or cosponsors in all project applications for planning as-

sistance received so far.

Size of a project is determined by local needs and desires. In all project applications to date, with one exception, the area has been greater than a single county and approximately  $\frac{1}{4}$  to 3 million acres. A project area must be small enough for effective local leadership but large enough to encompass the natural resources and related developments which directly affect the economy of the area.

Ten pilot projects were designated by Secretary Freeman on February 3, 1964, for USDA assistance in preparing comprehensive work plans. As of December 1, six of these plans have been completed and approved for operations.

### Why a Project Approach

The "project" approach has advantages over the usual program basis of most USDA activities in which services are available nationwide to eligible participants.

The project approach limits the area, gives sharp focus to use of funds and authorities, and concentrates the effort. Local leadership is most effective because its influence and interest are centered in the project area.

Coordinated effort by local interests and all Federal, State, and local agencies results in a truly comprehensive project plan for each area.

Local leadership is the key. It organizes and directs the technical and financial resources of all participants to carry out the project plan. All segments of the commu-

nity—rural, suburban, and urban—can coordinate their activities toward a unified approach in meeting local problems and improving resource use. Often, the very act of taking stock of resources and planning together for their use stimulates people to carry out measures on their own.

### RC&D Funds Help

RC&D funds may be used for additional technical help to speed up soil surveys and plan and apply conservation measures on individual operating units.

RC&D funds may be used also to help finance structural measures for flood prevention, erosion or sediment control, irrigation, or drainage that will provide community or group benefits. Generally, these special funds are available only for structures that cannot be installed in Public Law 566 watershed projects or through ACP pooling agreements.

RC&D funds provide direct assistance to community or group enterprises, such as for roads or plants for storage and processing of farm and nonfarm products.

Farmers Home Administration loans can be made to State and local public bodies and private nonprofit organizations to help meet the local share of development costs. Interest rates correspond to current Government borrowing. To be eligible, borrowers must: (1) Have authority to borrow money; (2) pledge security; (3) provide bond; (4) be able to repay; (5) be able to receive and disburse funds;



and (6) be able to raise revenue by some method. Nonprofit organizations must be organized under State law.

The 1964-65 Cropland Conversion Program will be used to the fullest extent possible in furthering RC&D objectives. A major need in several project areas is conversion of land now producing surplus crops to other income-producing uses.

RC&D accomplishments will encourage the flow of private investment capital into local activities. The resulting increased income and higher level of employment will reduce out-migration from the area.

### **The First Step—Application**

Sponsors of RC&D projects must have legal authority to sponsor project activities or facilities. Usually eligible are soil and water conservation districts, county governing bodies, municipalities, towns, local and State agencies, irrigation districts, public development corporations, and similar groups.

Other local groups and organizations may endorse the projects. For example, County Rural Areas Development Committees have been an important factor in stimulating interest in RC&D projects.

The sponsors draw up a project application outlining the resource problems and development opportunities as they see them. SCS and other agencies can help in this activity.

After approval by the Governor of the State, the application is forwarded to USDA for review and approval for planning assistance.

### **The Second Step—A Work Plan**

After USDA approval of the application, the SCS State Conservationist appoints a project coordinator to help local sponsors develop a comprehensive work plan and to serve as a focal point in coordinating assistance from the many State, Federal, and local

agencies. The Project Coordinator is a member of the SCS Area Conservationist's staff.

In a long-range plan for resource development, not all the needs can be adequately inventoried or described at the time of preparation. The plan usually describes in some detail measures of high priority that can be started within the next few years. Others that require further inventory and study are indicated in less detail or simply named. Generally, the project sponsors invite proposals from all sources in the area.

When the plan is completed, sponsors submit it to the Governor or the designated State agency. If it is approved, the SCS State Conservationist sends it to the Administrator. Review copies are sent to USDA and other agencies concerned, and to the Subcommittees for Agriculture Appropriations of the House and Senate.

Planning is a continuous process and can never be considered final. Work plans may be supplemented annually or as necessary to reflect changing conditions and the current actions of the project sponsors.

### **The Third Step—Operations**

If the work plan is approved by the Secretary of Agriculture, after agency and Congressional review, the project is ready for actual operations.

A coordinated approach is essential in carrying forward project operations. Sponsors must set priorities, arrange for cooperation of local agencies or groups, and establish major policies. They may elect to appoint a steering or executive committee for screening requests and advising the sponsoring groups. Many activities or project measures will be carried out entirely with local resources and for these the sponsors may simply act as a clearing house or suggest ideas.

The soil and water conservation district has an important place in project operations because of its authority under State law to carry

out broad land use programs. Other State and local governmental units also have an important place since they can act as contracting agencies, receive Federal or other funds, and operate and maintain works of improvement.

Federal agencies accelerate present programs such as technical conservation help, cost sharing, Public Law 566 projects, and loans for farm and group work. Land managing agencies, such as USDA's Forest Service and agencies in the Department of the Interior, accelerate conservation and development activities on public lands to provide additional employment and contribute to expansion of the local economy.

Additional forestry assistance is provided by the State forestry agency under cooperative arrangements with USDA.

State and local agencies have a prominent role in project activities. The Extension Service, Conservation Department, State and county highway departments, and numerous others are asked to help.

The future for RC&D projects is bright as a means of helping to improve the beauty and economic well-being of rural areas. The projects will help people help themselves in building a better America. ♦

### **Taking in Summer Boarders A Century-old Practice**

Vacation farms are not new in New England.

"Guests have been vacationing here on our farm ever since they traveled in stagecoaches and carriages," one farmer explained. "My great grandparents started this place in 1823, and the family began taking guests about 100 years ago. Guests are still coming."

Accepting summer guests is a traditional way of supplementing farm income in New England, reports a new USDA publication, "New England Farm Vacation Businesses" (Agr. Econ. Rpt. 60). ♦



# First 10 RC&D Projects Show Scope of Activities

**W**HAT is a Resource Conservation and Development Project like? A look at the 10 pilot projects already authorized gives some idea of what we can expect of this new type of conservation activity.

The primary requisite for an RC&D project is a need to intensify and speed up conservation work and natural resource development to improve the economy of an area.

While watershed projects are limited to 250,000 acres each, RC&D projects may include as much as 1 to 2 million acres. Most of them include more than one county.

In February the Secretary of Agriculture authorized 10 RC&D projects for USDA assistance in preparation of work plans. The projects were initiated and sponsored by local people as self-help programs of rural areas development.

## Common Objectives

All projects have in common land and water potentials that could significantly improve the area economy. The 10 pilot projects—in fact, most of the 25 applications received to date—include the following objectives in varying degrees:

(1) Water resource development for flood prevention, recreation, wildlife, domestic, agricultural, municipal, or industrial use. All the projects include one or more small watershed projects (Public Law 566).

(2) Acceleration or completion of the soil survey.

(3) Accelerated conservation planning and land treatment.

(4) Conversion of cropland to

grass, trees, wildlife, and recreation use.

(5) Recreation developments through multiple use of land and water, using existing resources and creating new ones.

(6) New industries to process agricultural and woodland or specialty products.

(7) Improved marketing of agricultural and livestock products.

(8) Long-range planning that will coordinate public efforts in the area.

Yet, each project is different in resources, in problems, and in planned solutions. Here are thumbnail descriptions of the unique features of each of the 10 pilot projects:

## Gwinnett County, Ga.

The project area covers 280,000 acres near Atlanta that is undergoing rapid change from an agricultural to an urban economy. The project is sponsored by the Upper Ocmulgee Soil and Water Conservation District and the Gwinnett County Commissioners. The sponsors propose to:

(1) Acquire and develop three large nature preserves for public use.

(2) Develop industrial parks for new or enlarged plants and attract new industries.

(3) Increase fish and wildlife development and improve management skills of private operators.

(4) Develop a variety of income-producing recreation enterprises to serve the metropolitan area.

## Lincoln Hills, Ind.

The area includes over a million acres along the Ohio River in

Crawford, Harrison, Perry, and Spencer counties. The soil and water conservation districts of the four counties are sponsors, and the project is endorsed by the four county Rural Areas Development Committees. Planned measures include:

(1) Develop income-producing recreation on private land and encourage tourism.

(2) Employ a recreation specialist.

(3) Install rural waterlines.

(4) Develop arts and crafts industries.

(5) Devote more land to grass and intensify livestock production.

## West Central Minnesota

The area of 2,404,000 acres includes all of Swift, Pope, Kandiyohi, and Wadena counties and the eastern part of Otter Tail County. The soil conservation districts and county boards of supervisors are the sponsors. Project measures are designed to:

(1) Install and develop 43 specific recreation and wildlife measures, including the Crow Wing Canoe Trail, restoration of a dam on Wing River and a lake on Blueberry River, a dam on Leaf River, a number of public parks, and privately owned recreation enterprises.

(2) Establish processing industries, such as alfalfa dehydrating plant, sugar-beet plant, woodchip plant, pallet plant, central maple syrup collection system and plant.

(3) Establish a tree and shrub nursery to supply 50 counties.

(4) Train more than 800 physically handicapped persons in vocational skills.

(5) Convert cropland on 350-400 farms to grassland and develop beef cow-calf operation.

## Northern Rio Grande, New Mex.

The project area comprises 2,879,123 acres in Taos, Rio Arriba, Santa Fe, and Los Alamos counties. The project sponsors are the soil and water conservation dis-



tricts, county commissioners, councils of the cities of Espanola and Santa Fe and the town of Taos, and the County Rural Areas Development associations. Project measures are designed to:

(1) Develop recreation facilities on 23 areas immediately and more than 100 later. Recreation enterprises are expected to contribute more than other resources to the economy in the next decade.

(2) Rehabilitate or improve 231 group irrigation systems.

(3) Construct 36 access roads to recreation and other areas.

(4) Improve 1,473,000 acres of rangeland on 205 operating units in 43 community groups.

(5) Improve and manage for multiple use 142,000 acres of private commercial forest and 1,320,000 acres of National forest.

(6) Install 57 processing and marketing facilities for fruit, chile, and other specialty crops and wood products.

(7) Provide vocational training for local people.

### **Upper Willamette Valley, Oreg.**

Located in the southern part of Willamette River Basin, the area includes parts of Lane, Linn, Benton, and Douglas counties, totaling 2,925,890 acres. Forests and woodlands comprise 79 percent of the land and include the largest block of virgin Douglas-fir timber in the world. Sponsors are the five soil and water conservation districts in the project area. Project plans include:

(1) Sustained yield from the forest resources with a balanced system of harvest on private and publicly owned timber.

(2) Development of additional local wood manufacturing and processing plants.

(3) Changes in cropping pattern to intensive truck, fruit, and berry crops.

### **North Idaho**

The project area of 2,243,703 acres is located in the panhandle of

northern Idaho and a small area of Spokane County, Wash. Sponsors are the soil and water conservation districts of Kootenai, Benewah, and Latah counties, Idaho, and Latah-Rock Creek District, Wash. Project measures are designed to:

(1) Revitalize privately owned timber industry by improved management and conservation.

(2) Seek a sustained yield of forest products on adapted sites.

(3) Develop markets for the small woodland owner.

### **Penn Soil, Pa.**

An area of 1.5 million acres covers Crawford, Mercer, and Venango counties in northwestern Pennsylvania. The project is sponsored by the soil and water conservation districts and county commissioners. The work plan includes:

(1) Construction of two major lakes for recreation and residence sites and recreation developments on others.

(2) Construction of six waterfowl and wildlife marshes and refuges.

(3) Providing planning assistance to municipalities in rapidly changing rural-urban areas of about 121,000 acres.

### **South Dakota**

The project covers 1,068,440 acres in Bon Homme and Charles Mix counties. The area lies along the Missouri River adjacent to Fort Randall Reservoir and Lewis and Clark Lake above the City of Yankton. A major problem is sediment deposition in the reservoirs. Sponsors are Fort Randall Conservancy Sub-District and three soil and water conservation districts. Objectives are to:

(1) Control deposition with structures to trap sediment.

(2) Accelerate land treatment on 311,000 acres of cropland, range, and pasture.

(3) Develop recreation facilities to supplement the attraction of the large lakes.

### **White River, Vt.**

The project area of 635,000 acres includes 23 towns in parts of Orange, Windsor, Rutland, and Addison counties in east central Vermont. The sponsors are the White River Soil and Water Conservation District and the White River Valley Association. Project measures are designed to:

(1) Develop new recreation facilities in the Green Mountain National Forest and on private land.

(2) Construct one large lake and several smaller ones for boating, fishing, and other recreational uses.

(3) Develop water resources for municipal and industrial uses.

(4) Conduct an educational program for farmers to include farm management counseling, forest management and wood utilization, improved leasing agreements, supplemental farm enterprises, and family partnership and property sale agreements.

### **Pri-Ru-Ta, Wis.**

An area of more than 2 million acres in north central Wisconsin includes Price, Rusk, and Taylor counties. Project sponsors are the soil and water conservation districts. Seventy-five percent of the total labor force is employed in agriculture, forestry, and related processing and wood industries. Project measures include:

(1) Creation of 26 new flowage lakes of 50 acres or more and many smaller ones for recreation.

(2) Development of 50 shallow wetland wildlife areas annually for the next 4 years.

(3) Construction of 50 miles of access roads and 250 miles of "tote" roads annually for the next 4 years on privately owned, county, and State forests.

(4) Establishment of two county-owned youth camps and two or more State and Federal camps for year-round educational and recreational use.

(5) Study of utilization and marketing of forestry products. ♦



## Alliance for Progress . . .

# Northern Rio Grande RC&D Project Awakens Area

By **Richard B. Bowen**

*Range Conservationist, SCS, Taos, N. Mex.*

**T**HERE is growing hustle and stir in northern New Mexico today. Communities are reawakening. The talk everywhere is of the plans that are drawn and ready . . . and of the work that is going on.

Work? Si, senior, of course. For, you see, the Northern Rio Grande Resource Conservation and Development Project has triggered action on a broad front.

It was more than 360 years ago that Juan Onate and his gallant band of caballeros established the

first white settlement in Southwestern United States.

Despite many hardships, the colonists established new colonies throughout the area. The settlers lived off the land, raised crops, and stock.

But life was not always easy. Economic and social problems have multiplied over the centuries.

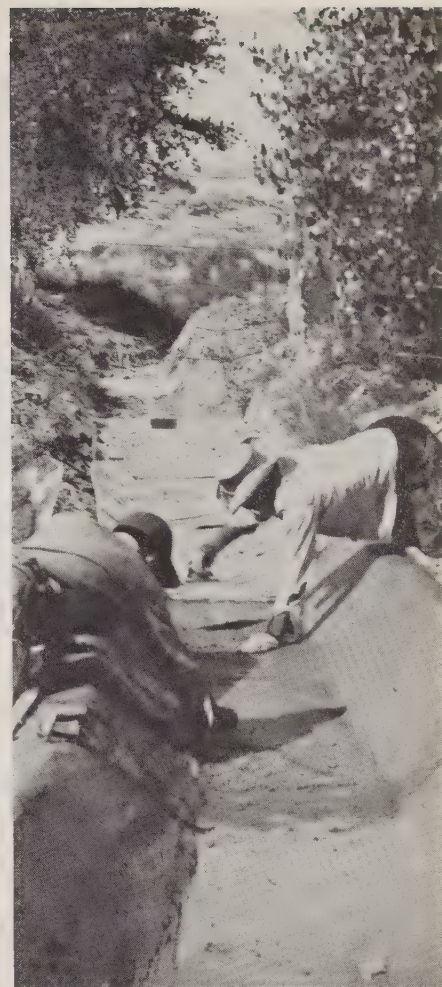
### Shoulder to Shoulder

Despite the historical importance and the scenic, mineral, agricultural, and manpower resources of the area, the people have only now rediscovered the vast potential of their lands.

The 1960's marked the beginning of a gigantic redevelopment of northern New Mexico by the people themselves. Citizens of several racial origins are working shoulder to shoulder with local, State, and Federal agencies in the rebirth of this historical scenic wonderland. The preparation of the RC&D work plan has revealed many places where there was no need to wait, where if people are willing they can find many sources of help to solve the problems that seemed hopeless for so long.

Take the Cabresto irrigation system, for example. The system long needed overhauling. The water loss was enormous, and the shortage, especially in the critical crop season, was costly. To say that water is life in the valley is to state the obvious.

The farmers served by the system learned in the planning that they could pool their cost-share assistance from the Agricultural



**Irrigation water users place concrete to line La Puebla Community Ditch for more effective water control.**

Conservation Program and, with technical help from the Soil Conservation Service and more cost-share help from the State Engineer's office, build their needed diversion works, and line the ditches that were so inefficient.

### Irrigation Projects

So, the Cabresto project is going ahead. The total job will cost \$50,000. The local owners will contribute \$15,000 and operate and maintain the project.

Add to this effort the work in other systems—San Cristobal, J. M. Barela, La Puebla, and El Sombrillo—and you have a part of the explanation of the new feeling of achievement in the area.

There are other places where work is going ahead, in projects



**Chili pods, here seen drying in the sun, are a high-return specialty of the Espanola Valley (photo courtesy of New Mexico Department of Development).**



stimulated by the planning in the Northern Rio Grande Project.

The 7-mile road to the Los Pinos River fishing and recreational area is finished. It cost \$47,000 and meant 1,020 man-days of work at good pay. It is expected to increase visitor use of the area three or four times.

The recreational area development at the Red River Hatchery, with a new bridge across Red River, is almost ready.

A member of the Velarde Fruit Growers Association, with local financing, built a packing shed for the season's fruit crop. This development came as a result of the appraisal, in the course of project planning, of the potential in the industry with improved facilities. The Association has applied to the Farmers Home Administration for a \$50,000 loan to buy processing and cold storage equipment.

### Recreation Areas

The Camp May Recreational Area, with Los Alamos County paying the bill, is nearing completion. Camping, picnic, and parking areas are included.

Meantime, the planning and drafting of designs for construction go ahead. There are many other irrigation improvement projects, all sorely needed.

Flood damage, especially to the irrigated croplands in the valley, has been a common and depressing factor. Seven applications for projects under the Watershed Pro-

tection and Flood Prevention Act have been made. Other structures of this kind are proposed with RC&D assistance.

Tourism and income-producing recreation are recognized as representing vast potential. Many other projects are in this direction, designed to make the tourist welcome and his stay more enjoyable.

There are 1,320,000 acres of National Forest land and 142,000 acres of commercial forests. Harvesting and processing of forest products are envisioned in the plan.

Roads and trails are considered important in the opening of the area to its potential. City, county, State, and Federal agencies are co-operating.

Water is the key to expansion of the area's agriculture, and the San Juan-Chama Project of the Bureau of Reclamation represents the principal opportunity for increasing water resources. The project provides for the annual diversion of 110,000 acre-feet from Colorado's San Juan River to the Rio Grande Basin, with 29,000 acre-feet to be allotted to the project area.

Project measures for the conservation and development of irrigated cropland, in addition to the improvement of irrigation systems, include improved water management, conservation cropping systems, and better forage management on pastures and meadows.

Measures designed to improve the productivity of 1,472,800 acres



**Orchard crops are an important part of the economy in the irrigated valleys of northern New Mexico.**

of rangeland include coordinated land treatment by private landowners and public land agencies. These measures will involve brush control, range seeding, erosion control, fencing, community livestock water development, and proper management of forage resources.

### Legislation Needed

Legislation will be needed to clear the way for some of the needed improvements, such as the establishment of boundaries and land titles, a prerequisite to the granting of some kinds of credit.

The sponsors of the project—among them the State of New Mexico, Rural Areas Development associations, and the Abiquiu-Vallecitos, Espanola Valley, Pojoaque-Santa Cruz, and Taos soil and water conservation districts—estimate that the annual income to the area will be increased by more than \$6 million within 3 years after the project is operational. They say it will mean more than 1,000 full-time jobs or the equivalent.

A local writer has called the project a "homemade kind of Alliance for Progress." That is getting close. The people of northern New Mexico are developing their resources for a better way of life. ♦



**The Northern Rio Grande RC&D Project area provides an abundance of camping, hiking, picnicking, hunting, and fishing opportunities.**



# Soil and Water Conservation and Resource Development

## Summary of Activities and Accomplishments of the Soil Conservation Service, 1964

**B**ROAD planning for community-wide benefits from resource conservation and development claimed increasing attention of the Soil Conservation Service in fiscal year 1964.

Upon designation of the first 10 Resource Conservation and Development (RC&D) projects by the Secretary of Agriculture, SCS assigned project coordinators for them and provided technical assistance to local sponsors in preparing project work plans. Throughout the Nation, SCS increased consultative services to planning agencies, organizations, and individuals by some 35 percent over the level of a year ago.

Meantime, continued assistance to private landowners and local agencies of government brought accelerated progress in applying needed conservation measures to the land.

### Efficiency of Operation

The results were recorded in a 3-percent increase in a number of conservation plans prepared by soil conservation district cooperators, 20 percent more watershed projects under construction, 30 percent more contracts signed in the Great Plains Conservation Program, and increases of 10 to 30 percent in the establishment of several major conservation practices on the land.

During the year, SCS provided direct services to 1,123,801 land owners and operators, an increase of 8 percent over the previous year. Of these, 753,425 applied one or more conservation practices, an in-

crease of 13 percent over the number in 1963.

The general increase in conservation accomplishments in fiscal 1964 was achieved with less than 1 percent increase in manpower or funds.

The Soil Conservation Service used 16,532 man-years of personnel in all programs in 1964, compared to 16,433 in 1963. Expenditures of all funds totaled \$207,787,000 in 1964 and \$193,176,000 in 1963.

The revised progress and time reporting system of SCS, using automatic data processing and matching expenditures against specific accomplishment items, now provides comparisons for 3 full years. These records show that the efforts of SCS to increase efficiency of operations have produced substantial gains in many areas.

For example, the 132,036 new conservation plans and revisions prepared in 1964 were obtained at an average cost of \$234 per plan and 55 cents per acre, compared to \$242 per plan and 59 cents per acre in 1963. This amounted to a 3-percent reduction in cost per plan and 7-percent reduction in cost per acre.

The time devoted to assisting land owners and operators prepare conservation plans resulted in 39 plans per man-year in 1964 compared to 36 per man-year in 1963, an increase of 8 percent.

The number of land owners and operators assisted increased from 94 per man-year in 1963 to 103 in 1964, a gain of 10 percent, and the number of services performed in-

creased from 280 per man-year in 1963 to 300 in 1964, a gain of 7 percent.

The cost per owner or operator assisted declined from \$85 in 1963 to \$82 in 1964, or 4 percent. The cost per service performed declined from \$29 to \$28, or 3 percent.

Sixty-seven percent of the co-operators receiving assistance in 1964 actually applied one or more conservation practices, compared to 64.2 percent who did so in 1963.

Soil surveys proceeded at an average rate of 32,321 acres per man-year and at a cost of 30 cents per acre in 1964, compared to 33,124 acres and 28 cents in 1963.

All the foregoing items are performed mainly with funds appropriated for assistance to soil conservation districts. The manpower used in district operations in 1964 was actually 95 man-years less than in 1963—12,261 compared to 12,356. Total funds expended for district operations, including reimbursable items, amounted to \$106,786,492 in 1964 and \$103,166,801 in 1963.

### Comprehensive Planning

A significant increase in broad resource planning occurred in several States during 1964.

In addition to the 10 pilot RC&D projects, SCS participated in many areas as a member of local committees and interagency groups engaged in resource and land use planning. The Service contributed especially by providing basic data and resource maps based on soil surveys, the Conservation Needs



Inventory, and related technical information.

Such planning was especially active in the rural-urban areas of the Northeast, the Northern Great Lakes area, Appalachia, and the Ozark region.

Many soil conservation districts broadened their programs to include district wide resource development and associated measures that would result in community-wide economic benefits. By the end of fiscal 1964, 1,319 or nearly half of the districts had adopted modernized programs and signed new basic memorandums of understanding with the Department covering their broadened activities.

SCS in fiscal 1964 provided 84,000 consultive services to planning agencies, organizations, and individuals, compared to 62,000 in 1963.

### **Developing Recreation Resources**

The Soil Conservation Service increased its services to land owners and operators interested in establishing income-producing recreation enterprises in 1964.

Nearly 13,000 soil conservation district cooperators made plans to install one or more such enterprises, a 43-percent increase over the previous year. Of these, more than 600 converted their operations primarily to recreation.

These enterprises resulted in devoting more than 206,000 acres of farm and ranch land to recreational use.

### **Cropland Conversion**

Substantial conversions of cropland to other uses resulted from the application of needed land treatment in watersheds and in establishing conservation plans on farms and ranches in soil conservation districts.

Exact figures are not available on the net effects of these adjustments, but records of conservation practices applied in fiscal 1964 indicate that between 2 and 3 million acres of cropland was shifted to

other uses as a result of these programs.

The major part of this acreage was converted to grassland. This included most of the 2.5 million acres of pasture and hayland planting done in fiscal 1964, 169,488 acres of range seeding on converted land, and 115,689 acres of grassed waterways established.

In addition to the grass planting, 90,517 acres of cropland was converted to woodland, 32,164 acres to wildlife and recreation uses, and 57,569 acres to other land uses.

### **Soil Conservation Districts**

The number of operating soil conservation districts increased from 2,942 to 2,971 in fiscal 1964. Forty-four new districts were organized and 15 were discontinued as a result of consolidation, subdivision, or other changes in status.

At the end of the fiscal year, the districts included 1,739,207,836 acres or 94 percent of the land in farms and 98 percent of the farms and ranches in the 50 States, Puerto Rico, and the Virgin Islands.

*Conservation Planning.*—Soil conservation districts assisted by SCS added 115,772 new cooperators, operating 41,566,765 acres of land, in fiscal 1964. This brought the total to 1,998,252 cooperators on 648,655,183 acres in district conservation programs.

During the year these cooperators prepared 108,380 new conservation plans on 38,459,206 acres, bringing the total to 1,515,280 plans on 475,049,352 acres. They revised 35,708 plans on 20,677,495 acres.

In addition to individual farm and ranch conservation plans, SCS helped prepare 2,832 group plans for adjoining land owners.

*Conservation Applied to the Land.*—Establishment of conservation practices on the land—the end result of conservation efforts—showed impressive gains on many fronts in fiscal 1964.

Soil conservation district cooperators and participants in other

programs receiving SCS assistance established 30,588,354 acres of conservation cropping systems, an increase of 34 percent over the record of 1963. They also practiced contour farming on 7,110,693 acres, an increase of 16 percent; crop residue use on 23,434,450 acres, an increase of 27 percent; and strip-cropping on 846,496 acres, an increase of 27 percent.

Total range and pasture seeding amounted to 3,015,775 acres, slightly less than in the previous year. Total tree planting, including farmstead windbreaks, was 365,563 acres, a decline of 2 percent from a year ago, but farmstead windbreak plantings of 39,115 acres were 79 percent more than in 1963.

Cooperators built 66,242 farm ponds, or 23 percent more than in 1963; 36,012 miles of terraces, or 11 percent less; and 115,689 acres of grassed waterways, or 7 percent less. They established conservation irrigation water management on 3,118,131 acres, or 29 percent more than a year ago, and completed irrigation land leveling on 452,058 acres, 12 percent less than in 1963.

Cooperators developed upland wildlife habitat on 193,726 acres, an increase of 28 percent, and wetland wildlife habitat on 76,431 acres, an increase of 11 percent.

### **Watershed Protection**

*Small Watershed Projects.*—The authorization in 1964 of 112 watersheds for planning under Public Law 566 brought the total to 1,002, or 47 percent of the applications received to date. State and local authorities have again recognized the growing planning load with a 17-percent increase in non-Federal funds for planning. Their estimated contributions amounted to more than \$2.3 million in fiscal 1964.

Ninety-six projects were approved for operations during fiscal year 1964, the largest number in any year to date and the third year of an upward trend. Initial agreements for construction were signed



in 46 projects located in 30 States, making almost 400 projects that have entered the construction stage out of 569 approved for Federal assistance in the installation of works of improvement.

Local sponsoring organizations have acquired more than 16,500 easements and rights-of-way valued at about \$24 million.

All land treatment and structural measures have been completed in 66 projects located in 29 States. Eleven were completed in fiscal 1964. Structural measures have been completed in 41 additional projects.

**Multipurpose Projects.**—Almost 44 percent of all the projects in operation have multiple objectives combining watershed protection and flood prevention with such purposes as recreation, fish and wildlife, irrigation, drainage, and municipal water supply. A year ago the figure was only 38 percent. Sixty percent of the projects approved in 1964 are multipurpose, compared to 13 percent of those approved in 1956.

**Other Watershed Projects.**—Work plans were prepared for 9 subwatersheds in the 11 major river watersheds authorized for flood prevention work. The work plans cover 350,000 acres and bring the total to 230 work plans on 17,668,000 acres, or 57 percent of the authorized area.

Construction work is complete in one watershed. Buffalo Creek in New York. Almost 60 miles of stream channel erosion was controlled to reduce siltation in the Buffalo harbor.

All works of improvement have been installed in 48 of the 54 pilot watershed projects. Three more are scheduled for completion in 1965, and 3 will continue in operation after 1965.

## River Basin Surveys

The Department of Agriculture cooperated in 30 river basin surveys and investigations in fiscal 1964. SCS has overall departmental re-

## Summary of Progress, Fiscal Year 1964 Soil and Water Conservation in the United States

Progress items	Accomplished in fiscal year 1964—			Cumulative to June 30, 1964
	By use of funds under all SCS programs	By State employees & other agencies	Total reportable progress	
Individual Conservation Plans and Related Services				
District cooperators .. No. ....	115,604	168	115,772	1,998,252
District cooperators .. acres.....	41,543,843	22,922	41,566,765	648,655,183
Cooperators canceled .. No. ....	69,850	31	69,881	—
Cooperators canceled .. acres....	20,934,909	4,129	20,939,038	—
Landowners assisted .. No. ....	1,106,823	16,978	1,123,801	—
Services provided .. No. ....	3,298,338	50,224	3,348,562	—
Owners applying practices..No...	745,403	8,022	753,425	—
Basic plans prepared:				
Farm..No. ....	99,383	830	100,213	1,440,246
Ranch..No. ....	4,628	1	4,629	56,858
Other..No. ....	3,538	—	3,538	18,176
(Total basic plans).....	(107,549)	(831)	(108,380)	(1,515,280)
Farm .. acres.....	21,326,223	152,784	21,479,007	295,443,995
Ranch .. acres.....	16,571,450	80	16,571,530	176,376,555
Other .. acres.....	408,669	—	408,669	3,228,802
(Total basic plans, acres) ...	(38,306,342)	(152,864)	(38,459,206)	(475,049,352)
Basic plans canceled:				
Farm..No. ....	43,436	282	43,718	—
Ranch..No. ....	1,804	—	1,804	—
Other..No. ....	589	—	589	—
(Total plans canceled).....	(45,829)	(282)	(46,111)	—
Farm..acres .....	8,469,640	51,087	8,520,727	—
Ranch..acres .....	5,869,332	—	5,869,332	—
Other..acres .....	23,766	—	23,766	—
(Total plans canceled, acres) (14,362,738)	(14,362,738)	(51,087)	(14,413,825)	—
Basic plans revised:				
Farm..No. ....	32,873	188	33,061	—
Ranch..No. ....	2,482	—	2,482	—
Other..No. ....	165	—	165	—
(Total plans revised) .....	(35,520)	(188)	(35,708)	—
Farm .. acres.....	9,724,912	41,149	9,766,061	—
Ranch .. acres.....	10,851,131	—	10,851,131	—
Other .. acres.....	60,303	—	60,303	—
(Total plans revised, acres) (20,636,346)	(20,636,346)	(41,149)	(20,677,495)	—
Consultive Services				
Services provided .. No. ....	82,999	950	83,949	—
Operating Units				
Total operating units .. No. ....	—	—	—	4,750,182
Total operating units .. acres....	—	—	—	1,346,318,560
Other units .. No. ....	—	—	—	1,194,660
Group Conservation Plans and Services				
Irrigation:				
Group investigations .. No. ....	1,193	—	1,193	5,750
Group investigations .. acres....	683,624	—	683,624	6,923,229
Group plans prepared .. No. ....	735	—	735	4,704
Group plans prepared .. acres....	472,558	—	472,558	5,323,166
Landowners in group .. No. ....	6,327	—	6,327	71,513
Drainage :				
Group investigations .. No. ....	1,979	63	2,042	22,566
Group investigations .. acres....	745,999	11,327	757,326	14,850,644
Group plans prepared .. No. ....	1,773	57	1,830	24,509
Group plans prepared .. acres....	648,072	7,391	655,463	14,403,486
Landowners in group .. No. ....	9,056	190	9,246	134,223
Erosion control—Flood prevention:				
Group investigations .. No. ....	288	14	302	1,544
Group investigations .. acres....	1,030,579	2,251	1,032,830	5,905,711
Group plans prepared .. No. ....	220	12	232	1,222
Group plans prepared .. acres....	1,085,389	2,247	1,087,636	4,723,338
Landowners in group .. No. ....	1,282	23	1,305	15,023
Wildlife-Recreation:				
Group investigations .. No. ....	37	—	37	102
Group investigations .. acres....	112,873	—	112,873	791,009
Group plans prepared .. No. ....	35	—	35	63
Group plans prepared .. acres....	62,945	—	62,945	162,415
Landowners in group .. No. ....	356	—	356	568
Total group services .. No. ....	44,879	999	45,878	—



# Summary of Progress, Fiscal Year 1964—Continued

Progress items	Accomplished in fiscal year 1964—			Cumulative to June 30, 1964
	By use of funds under all SCS programs	By State employees & other agencies	Total reportable progress	
Great Plains Conservation Program				
Applications received .. No. ....	4,488	—	4,488	20,853
Applications received .. acres....	6,349,275	—	6,349,275	43,624,807
Contracts signed .. No. ....	3,719	—	3,719	16,121
Contracts signed .. acres.....	5,453,644	—	5,453,644	33,882,548
Contract modifications .. No. ....	12,714	—	12,714	50,415
Contracts terminated:				
By mutual consent .. No. ....	56	—	56	270
By mutual consent .. acres....	82,637	—	82,637	645,789
For cause .. No. ....	58	—	58	290
For cause .. acres.....	55,192	—	55,192	268,188
By expiration .. No. ....	1,141	—	1,141	2,674
By expiration .. acres.....	1,651,081	—	1,651,081	4,146,342
(Total terminations .. No.)..	(1,255)	—	(1,255)	(3,234)
(Total terminations .. acres)	(1,788,910)	—	(1,788,910)	(5,060,319)
Cropland before GP contract, acres	997,758	—	997,758	4,751,684
Planned cropland conversion, acres	248,626	—	248,626	1,112,333
Agricultural Conservation Program				
Referrals received F.Y.1964 .. No.	357,976	95	358,071	—
Referrals received P.Y.1963 .. No.	—	—	—	352,664
Referrals serviced F.Y.1964 .. No.	343,557	4,389	347,946	—
Referrals serviced P.Y.1963 .. No.	—	—	—	341,072
Cropland Conversion Program				
Forms ASCS-312 referred to SCS .. No. ....	19	—	19	—
Assistance completed .. No. ....	29	—	29	—
CCP referrals received .. No. ....	430	—	430	—
CCP referrals serviced .. No. ....	403	3	406	—
Soil Surveys				
Standard soil surveys:				
High intensity mapping .. acres	1,831,750	143,235	1,974,985	23,874,790
Med. intensity mapping .. acres	29,451,759	1,818,544	31,270,303	438,766,640
Low intensity mapping .. acres	10,461,611	1,106,664	11,568,275	63,927,769
(Total mapping) ..	(41,745,120)	(3,068,443)	(44,813,563)	(526,569,199)
High intensity conversions .. acres	803,930	3,782	807,712	—
Med. intensity convers. .. acres	16,303,267	279,675	16,582,942	—
Low intensity convers. .. acres	774,548	9,671	784,219	—
(Total conversions) ..	(17,881,745)	(293,128)	(18,174,873)	—
Reconnaissance mapping .. acres.	1,098,534	81,681	1,180,215	9,746,500
Reconnaissance conversions .. acres	71,597	3,280	74,877	—
Soil conservation surveys .. acres	2,666,984	141,084	2,808,068	296,012,777
Soil conservation surveys canceled or converted .. acres..	29,398,559	88,921	29,487,480	—
Supplemental soil surveys .. acres	1,188,020	6,398	1,194,418	—
Snow Surveys & Water Supply Forecasting				
Snow course measurements .. No.	3,301	1,171	4,472	—
Aerial snow marker readings..No.	500	225	725	—
Mountain precipitation gage readings .. No. ....	1,082	140	1,222	—
Soil moisture readings .. No. ....	1,184	177	1,361	—
River stations for which numerical forecasts issued..No. ....	400	—	400	—
Numerical forecasts issued .. No.	2,132	—	2,132	—
Income-Producing Recreation Enterprises				
Landowners with one or more income-producing recreation enterprises .. No. ..	9,395	1	9,396	26,165
Landowners with recreation enterprises as primary income source .. No. ....	644	—	644	2,125
Landowners with recreation enterprises as primary income source .. acres.....	206,361	—	206,361	536,751
Public Recreation Developments				
Developments established as part of a watershed project .. No. .	6	—	6	18

sponsibility for these surveys, conducted by SCS, Economic Research Service, and Forest Service in cooperation with other Federal and State agencies.

The recommendation by the Senate Select Committee on National Water Resources that comprehensive plans be developed for all major river basins by 1970 has been adopted as an objective of the Administration.

The first coordinated river basin planning budgets were prepared by the concerned Federal agencies for fiscal year 1964. The 1965 estimates are being submitted as a coordinated budget for each river basin. This procedure is helping to establish the Department of Agriculture as a co-partner with the Departments of the Army, Interior, and Health, Education, and Welfare in river basin planning.

The following river basin surveys were in progress during the fiscal year:

Type I surveys, providing a general analysis of each region, for the Ohio River, Upper Mississippi River, and Missouri River Regions.

Type II surveys, providing in addition plans for specific proposals for projects during the next 10 to 15 years, in 15 river basins.

Type IV surveys, being made with State water resource agencies and other Federal agencies, in 12 river basins.

## Great Plains Conservation Program

Out of the 422 counties authorized to participate in the Great Plains Conservation Program, 392 had been so designated by June 30, 1964. Land owners and operators signed 3,719 contracts covering complete conservation plans on 5,453,644 acres during the year. This brought the total to 16,121 cost-sharing contracts covering 33,882,548 acres. A backlog of 4,732 applications awaiting technical and financial assistance was carried over to the new fiscal year when



new appropriations would become available.

Contracts signed in fiscal 1964 include plans for 248,626 acres of cropland conversion, or approximately a fourth of the existing cropland on these farms and ranches. Participating landowners in the program to date have planned 1,112,333 acres of cropland conversion, or 23 percent of their cropland before planning.

Establishment of the conservation practices called for by the contracts moved forward at an accelerated pace. The total amount of cost-shares paid was \$8,951,720, a 27-percent increase over the \$7,-069,570 the previous year.

Establishment of permanent vegetative cover continued to be the most important practice in the program, accounting for \$1,559,798 of the cost-shares paid. Participants established or reestablished 185,656 acres of new vegetation under this practice, compared to 161,800 acres in 1963, a gain of 15 percent.

### Soil Surveys

During fiscal 1964 soil mapping by SCS and cooperating agencies was completed on 65,796,504 acres, compared to 68,324,100 in 1963. Ninety-one percent, or 60,085,491 acres, was mapped with SCS funds appropriated for technical assistance to soil conservation districts.

The cumulative total of 822,581,976 acres mapped to date (published and unpublished) in a way suitable for farm and ranch planning is about 36 percent of the total land area of the United States or 43 percent of the 48 mainland States.

Work was in progress on January 1, 1964, on 2,338 soil survey areas, including 710 progressive surveys.

*Service to Urban Areas.*—The use of soil surveys in land use planning in urban and urban-fringe areas continued to increase in 1964. Many local planning commissions and consultants are en-

## Summary of Progress, Fiscal Year 1964—Continued

Practices	Accomplished in fiscal year 1964—			On the land June 30, 1964
	By use of funds under all SCS programs	By State em- ployees & other agencies <sup>1</sup>	Total reportable progress	
Conservation Practices Applied				
Bedding . . acres.....	25,609	1,142	26,751	358,071
Brush and weed control . . acres.	5,113,018	28,064	5,141,082	30,353,703
Irrigation canal or lateral . . miles	380	20	400	37,022
Cattle walkway . . miles.....	8	—	8	235
Chiseling . . acres.....	429,284	1,031	430,315	2,988,343
Clearing and snagging . . miles..	125	—	125	1,634
Conservation cropping system . . acres.....	30,446,096	142,258	30,588,354	140,616,764
Contour farming . . acres.....	7,064,976	45,717	7,110,693	40,836,189
Contour furrowing . . acres.....	59,758	7	59,765	600,415
Contouring orchard, etc. . . acres	16,649	70	16,719	206,529
Controlled burning . . acres.....	475,589	360	475,949	2,975,227
Cover and green manure crop . . acres.....	5,436,923	28,723	5,465,646	24,697,760
Critical area planting . . acres...	44,435	22,432	66,867	1,186,148
Crop residue use . . acres.....	23,330,381	104,069	23,434,450	102,162,588
Cutback border . . feet.....	342,752	—	342,752	6,043,380
Dam, diversion . . No. ....	923	8	931	17,098
Dam, multiple-purpose . . No. ...	217	6	223	4,736
Debris basin, No. ....	2,917	19	2,936	84,336
Range deferred grazing . . acres	20,803,498	445	20,803,943	47,751,686
Desilting area . . acres.....	174	—	174	2,211
Dikes and levees . . miles.....	238	6	244	7,780
Irrigation ditch and canal lining . . miles.....	1,503	53	1,556	17,350
Ditchbank seeding . . miles.....	1,400	61	1,461	15,376
Diversions . . miles.....	3,063	45	3,108	85,646
Dune stabilization . . acres.....	1,728	9	1,737	68,489
Emergency tillage . . acres.....	262,751	1	262,752	3,111,362
Farm pond . . No. ....	65,070	1,172	66,242	1,354,041
Farmstead and feedlot windbreak . . acres.....	38,703	412	39,115	581,460
Field border planting . . miles...	1,180	79	1,259	37,703
Irrigation field ditch . . miles....	3,665	329	3,994	113,734
Field windbreak . . miles.....	4,135	134	4,269	68,317
Firebreaks . . miles.....	13,574	52	13,626	123,993
Fish and crop rotation . . acres..	14,193	—	14,193	25,544
Fishpond stocking . . No. ....	36,523	445	36,968	677,103
Fishpond management . . No. ....	12,282	28	12,310	71,255
Floodwater diversions . . feet....	62,291	1,300	63,591	923,100
Floodwater-retarding structure . . No. ....	843	1	844	6,949
Floodway . . miles.....	34	3	37	349
Grade stabilization structure..No.	6,868	196	7,064	122,815
Grasses & legumes in rotation . . acres.....	1,800,540	22,671	1,823,211	14,465,138
Grassed waterway or outlet . . acres	113,999	1,690	115,689	2,021,370
Hedgerow planting . . miles.....	459	69	528	32,044
Hillside ditch . . miles.....	377	115	492	8,699
Irrigation pipeline . . miles.....	3,987	74	4,061	38,457
Irrigation storage reservoir . . No.	2,174	11	2,185	35,342
Irrigation system, sprinkler . . No.	4,121	69	4,190	80,115
Irrigation system, surface and subsurface . . No. ....	5,076	201	5,277	90,716
Irrigation system, tailwater recovery . . No. ....	640	7	647	5,735
Irrigation water management . . acres.....	3,110,598	7,533	3,118,131	9,715,734
Land clearing . . acres.....	648,391	5,497	653,888	10,465,043
Drainage land grading . . acres..	23,520	1,719	25,239	143,796
Irrigation land leveling . . acres..	440,901	11,157	452,058	8,027,430
Land smoothing . . acres.....	318,077	2,102	320,179	3,999,584
Livestock exclusion . . acres.....	1,015,782	5,124	1,020,906	16,319,475
Minimum tillage . . acres.....	1,104,209	1,342	1,105,551	4,994,500
Drainage main or lateral . . miles	8,012	686	8,698	273,065
Mole drain . . miles.....	817	—	817	1,733
Mulching . . acres.....	40,644	123	40,767	373,780
Mulch planting . . acres.....	62,623	25	62,648	149,462
Woodland natural seeding . . acres	100,860	4,008	104,868	2,516,768
Obstruction removal . . acres.....	44,606	178	44,784	595,455



# Summary of Progress, Fiscal Year 1964—Continued

Practices	Accomplished in fiscal year 1964—			On the land June 30, 1964
	By use of funds under all SCS programs	By State em- ployees & other agencies <sup>1</sup>	Total reportable progress	
Conservation Practices Applied—Continued				
Pasture and hayland renovation . . acres . . . . .	1,532,402	13,387	1,545,789	16,610,034
Pasture and hayland planting . . acres . . . . .	2,463,774	35,684	2,499,458	42,289,340
Pipeline for livestock water . . miles . . . . .	1,695	29	1,724	12,466
Pitting . . acres . . . . .	16,491	—	16,491	166,402
Plow planting . . acres . . . . .	129,219	395	129,614	1,170,285
Pond sealing or lining . . No. . . . .	845	6	851	5,056
Pasture proper use . . acres . . . . .	8,624,019	51,904	8,675,923	26,553,902
Range proper use . . acres . . . . .	84,036,584	5,845	84,042,429	179,155,340
Woodland proper grazing . . acres . . . . .	1,779,332	1,003	1,780,335	8,883,386
Pumped well drain . . No. . . . .	5	1	6	101
Pumping plant for water control . . No. . . . .	2,433	109	2,542	36,551
Range renovation . . acres . . . . .	28,101	6	28,101	1,563,916
Range seeding on converted land . . acres . . . . .	169,438	50	169,488	4,134,869
Range seeding . . acres . . . . .	346,100	729	346,829	7,282,546
(Total range seeding, acres)	(515,538)	(779)	(516,317)	(11,417,415)
Irrigation pit or regulating reservoir . . No. . . . .	3,480	18	3,498	35,091
Regulating water in drainage systems . . acres . . . . .	113,756	13	113,769	775,302
Rock barrier . . feet . . . . .	11,218	—	11,218	272,756
Range rotation—deferred grazing . . acres . . . . .	2,716,041	44	2,716,085	8,646,387
Row arrangement . . acres . . . . .	358,609	340	358,949	1,755,759
Rotation grazing . . acres . . . . .	4,318,254	42,074	4,360,328	12,814,327
Recreation access road . . feet . . . . .	2,339,872	129,189	2,469,061	10,300,902
Recreation area stabilization . . acres . . . . .	506	4	510	12,382
Recreation area planting . . acres . . . . .	12,071	83	12,154	38,655
Recreation area pruning and thinning . . acres . . . . .	5,778	364	6,142	18,337
Recreation land grading and shaping . . acres . . . . .	14,949	45	14,994	22,284
Recreation trail & walkway . . feet . . . . .	906,034	38,631	944,665	4,432,261
Spoilbank spreading . . miles . . . . .	5,074	95	5,169	110,432
Spring development . . No. . . . .	4,714	60	4,774	77,650
Stock trail . . miles . . . . .	201	1	202	2,875
Streambank protection . . miles . . . . .	227	3	230	3,604
Stream channel improvement . . miles . . . . .	696	3	699	8,072
Stream channel stabilization . . feet . . . . .	75,437	1,900	77,337	2,366,833
Stripcropping, contour . . acres . . . . .	218,377	5,677	224,054	5,105,593
Stripcropping, field . . acres . . . . .	93,767	332	94,099	2,166,763
Stripcropping, wind . . acres . . . . .	527,986	357	528,343	12,116,837
(Total stripcropping, acres)	(840,130)	(6,366)	(846,496)	(19,389,193)
Structures for water control . . No. . . . .	83,769	704	84,473	1,304,441
Stubble mulching . . acres . . . . .	3,919,938	7,860	3,927,798	17,526,407
Drainage field ditch . . miles . . . . .	7,790	287	8,077	147,408
Terrace, basin . . miles . . . . .	93	11	104	2,190
Terrace, gradient . . miles . . . . .	18,359	270	18,629	848,178
Terrace, level . . miles . . . . .	13,595	163	13,758	342,184
Terrace, parallel . . miles . . . . .	3,444	77	3,521	29,894
(Total terraces, miles)	(35,491)	(521)	(36,012)	(1,222,446)
Tile drain . . miles . . . . .	25,207	1,625	26,832	598,830
Tile system structure . . No. . . . .	9,200	579	9,779	140,523
Toxic salt reduction . . acres . . . . .	72,641	197	72,838	905,587
Tree planting . . acres . . . . .	305,122	21,326	326,448	10,728,892
Trough or tank . . No. . . . .	11,634	325	11,959	256,729
Vegetative barrier . . miles . . . . .	250	187	437	5,614
Vertical drain . . No. . . . .	23	—	23	1,293
Waterspreading . . acres . . . . .	41,550	687	42,237	810,798
Well . . No. . . . .	7,624	303	7,927	298,065
Wildlife habitat preservation . . acres . . . . .	1,379,576	2,542	1,382,118	6,147,848

tering into cooperative agreements to cost-share soil surveys. In 1964 SCS had 37 such agreements.

In addition, several States are appropriating funds to accelerate soil surveys. Some outside agencies, like the State Department of Commerce in Massachusetts, have published maps and reports made by SCS for planning agencies.

Soil surveys as part of regular soil conservation district operations are in progress in 364 areas in which there is urban expansion. Fieldwork has been completed in 125 of these areas, of which 79 have been published. Soil surveys are planned to start in 29 new areas having urban expansion in fiscal 1965.

*Publication.*—Thirty-four soil surveys were published during the year, and 35 edited manuscripts were sent to the Government Printing Office. Between 35 and 40 soil survey manuscripts will be available for editing and preparation for the printer in fiscal year 1965.

*Interpretations.*—All manuscripts now contain soil interpretations for engineering uses. Where woodland or range is an important land use, soil interpretations for these uses are included also.

Most of the new reports now contain soil interpretations for urban development, sewage disposal, recreational development, wildlife interpretations, and interpretations for special crops such as fruits and vegetables.

*Classification.*—A list of the established and tentative soil series of the United States, current as of July 15, 1963, was prepared and distributed during the fiscal year. The total number of series is approximately 8,000. During the year, 470 new series were proposed and 196 tentative series dropped after they had been tested.

Work was continued on revision of the soil classification system with a further trial grouping of series into families and with modifications of some definitions. Plans were made for adoption of the new



system in fiscal 1965.

A group of articles on the new classification system was published early in the fiscal year as one full issue of *Soil Science*.

## Advances in Technology

*Agronomy.*—The interpretation of soils information and correlation of crop and pasture yields on benchmark soils progressed significantly during the year.

Using recent research information on the factors affecting soil blowing, SCS agronomists have developed "wind erosion curves" that work unit staffs can use effectively in planning for adequate wind erosion control in all the Great Plains States. These guides are useful in preparing specifications for stubble mulching and crop residue use.

The equation is also useful in the vegetable growing areas of New Jersey and Delaware where soil blowing damages the quality of the crop. Soil movement there must be reduced to less than 2 tons per acre, and the equation tells how far apart the permanent and temporary wind barriers need to be to limit soil blowing to this level.

Improvements in establishing vegetation on critical areas in watershed projects have led to significant reductions in cost. For example, a \$12,000 saving was made in a watershed in the Northeast by eliminating the use of topsoil on the fill and borrow areas where the soil material was of a nature permitting direct seeding. In Massachusetts the cost of vegetating structures was reduced from \$1,200-\$1,700 to \$500-\$700 per acre.

*Range Conservation.*—SCS is extending its assistance in range conservation into areas where native pastures formerly were given little attention. Gratifying progress was made in the Corn Belt where 124 SCS employees were given training in plant identification, recognition of range sites and conditions, and livestock management. Basic

## Summary of Progress, Fiscal Year 1964—Continued

Practices	Accomplished in fiscal year 1964—			On the land June 30, 1964
	By use of funds under all SCS programs	By State em- ployees & other agencies <sup>1</sup>	Total reportable progress	
Conservation Practices Applied—Continued				
Wildlife wetland development . . acres . . . . .	75,201	1,230	76,431	842,031
Wildlife habitat development . . acres . . . . .	192,105	1,621	193,726	2,485,123
Wildlife wetland preservation . . acres . . . . .	159,511	271	159,782	1,202,684
Wildlife watering facility . . No..	316	18	334	4,803
Woodland direct seeding . . acres	12,588	306	12,894	315,516
Woodland harvest cutting . . acres	839,301	8,596	847,897	12,338,684
Woodland intermediate cutting . . acres . . . . .	905,285	3,358	908,643	12,083,965
Woodland interplanting . . acres.	27,278	822	28,100	711,473
Woodland pruning . . acres . . . . .	15,469	2,294	17,763	272,364
Woodland thinning . . acres . . . . .	63,766	2,877	66,643	1,563,021
Woodland underplanting . . acres	25,085	2,207	27,292	620,435
Woodland weeding . . acres . . . . .	453,456	7,754	461,210	8,215,960
Land Use Conversions <sup>2</sup>				
Cropland to grassland . . acres...	1,241,608	1,854	1,243,462	6,812,528
Cropland to woodland . . acres...	90,353	164	90,517	864,024
Cropland to wildlife- recreation . . acres . . . . .	31,890	274	32,164	313,546
Cropland to "other" . . acres . . .	57,147	422	57,569	1,380,282
All other uses to cropland . . acres	217,307	656	217,963	1,976,042
All other uses (except cropland) to wildlife-recreation . . acres . .	161,696	159	161,855	1,181,576

<sup>1</sup>Includes certain practices on the lands of new SCD cooperators applied without SCS assistance.

<sup>2</sup>Conversions on the land June 30, 1964, are estimates of conversions since July 1, 1962.

soil and plant evaluations were started. A professional range conservationist was added to the staff in Mississippi.

To meet the needs of multiple-use conservation programs, SCS has modified range survey procedures to provide basic information for planning all rangeland uses.

Analysis of vegetation composition now includes all the production of all the plants—including twigs, leaves, fruits, nuts, and stems—rather than only the herbage grazed by domestic livestock, as was the former practice. The resulting information reflects the true productivity of different sites and shows the value of the vegetation for game, recreation, and other uses as well as for livestock grazing.

*Woodland Conservation.*—The SCS devised and put into use in 1964 a new "woodland information stick" to aid fieldmen in analyzing woodland problems with land owners and operators. On the stick, which is 25 inches long, are printed scales for measuring diameter and height of trees and data for other-

wise evaluating stands of trees by short-cut methods. In effect, the stick is a condensed handbook and checklist of information to be used by nonforesters in considering woodlands in conservation planning.

*Biology.*—The system of soil interpretations for wildlife production and conservation developed in the Northeast was applied with minor modifications to the Corn Belt and Western States, and to a limited extent in the Great Plains.

The SCS continued to develop techniques to make inland wetlands and farm ponds more productive of migratory waterfowl, particularly of wild ducks.

*Plant Materials.*—Biologists and plant materials specialists are searching for plants that can be used to improve waterfowl food sources in the Western States. More than 500 separate plant accessions gathered from around the world have been placed under observation at various plant materials centers in the Pacific flyway. From this systematic field study, a number of superior plants have



evolved. One plant, a smartweed (*Polygonum*), has produced up to 5 tons of choice waterfowl food per acre. Other superior food plants include strains of bulrush (*Scirpus*) and duckmillet (*Echinochloa*).

Plant materials centers also are providing other new plants for recreation and wildlife land uses. One center has tested and developed species and techniques for shooting-preserve cover. Another works closely with a wildlife experiment station in observing wildlife use of conservation plants.

A whole range of new plant materials will be useful in watershed treatment, on streambanks, flood pool margins, detention structures, and the like, as well as having wildlife and aesthetic values.

*Engineering.*—The overall design work load continued to increase significantly in 1964, but no critical imbalance in seasonal workload was reported.

"Specifications for Construction Contracts" was published and distributed. The following design criteria and standards were completed: (1) Program No. 4, "Culverts Rating Program;" (2) Interim Report 1 on "Proportioning Earth Dams;" (3) "Criteria and Procedures for the Structural Design of Standard Covered Risers;" (4) "Example Plans for Standard Covered Risers;" (5) "Standards for Drop Inlet Spillways."

A consolidated report of four surveys of the condition of principal spillway pipe conduits was published.

Investigations of irrigated land needing drainage were made to find ways to prevent the accumulation of saline and alkali salts. The findings emphasize the need for superior engineering design, good materials, and careful construction to cope with the problem.

A revised national standard on dikes and levees and one on pump-plants were issued.

Much progress was made during the year in the installation of

structures for the control of active gullies that interfere with the installation and maintenance of soil and water conservation practices.

National standards were developed for a group of practices having special applications to recreation developments.

Farm equipment manufacturers continue to enlarge their equipment and increase its speed of operation. This places emphasis on the importance of obtaining the best terrace alignment in all cases. Smoothing and grading upland fields prior to terrace construction are on the increase.

The benefits of the electronic computer work of last year began to be realized this year. The program computes storm runoff of a stream resulting from any synthetic or actual rainstorm, taking into account all conditions that have a bearing on runoff.

New standards for concrete irrigation pipelines were developed with the American Concrete Pipe Association; for wrapped aluminum pipe, in cooperation with the Sprinkler Irrigation Association; and for plastic irrigation pipelines, in cooperation with the Society of the Plastics Industry. Standards and specifications were prepared for planning and installing permanent sprinkler irrigation systems in citrus groves of Florida.

Emphasis continues on the improvement of irrigation water management practices, but the accomplishment in this work is spotty. Courses in irrigation water management have been started in the western training centers to help overcome this deficiency.

*Water Supply Forecasting.*—Four new snow courses were established in the Yukon River Basin north of the Arctic Circle.

Extensive tests of the accuracy of various types of snow sampling equipment were conducted during the past season. An expanded program in the testing and evaluation of the pressure pillow as an auto-

matic snow gage was continued during the year in a pilot study on Mt. Hood. The results were so successful that similar equipment is to be installed for several States in the coming fiscal year. Some of these installations will be equipped with telemetry.

*Conservation Needs Inventory.*—During 1964, data from the Conservation Needs Inventory were used in many ways, some of the basic sample soil data were further refined, and progress was made on plans for updating the Inventory.

## Foreign Programs

During the year the Soil Conservation Service operated in Tunisia and Algeria, under contractual agreement with the Agency for International Development (AID) of the Department of State, whereby SCS assumes operating responsibility for technical phases of the programs. In addition, a number of specialists were made available to AID for work in other parts of the world.

During the period 1961-63, SCS provided training to a total of 1,059 foreign nationals from 63 countries at more than 50 field locations in the United States.

## Personnel Management

In August 1963, the USDA Boards of Civil Service Examiners were abolished and agency boards established. Three SCS boards were organized with headquarters at Salt Lake City, Fort Worth, and Washington, D. C.

Incentive awards of some kind were made to a total of 1,982 SCS employees in 1964. Of these, 289 were for employee suggestions for improvement put into effect, and 985 awards were for superior performance. Five individuals and 2 units received Superior Service Honor Awards from the Secretary.

Training programs were strengthened by use of the facilities of other Government agencies and sources outside the Government service. ♦





Robert E. Hendershot.

## Conservation Work Wins FFA Award

**W**INNER of the 1964 Future Farmers of America award in soil and water conservation is Robert E. Hendershot, 18, of Baltimore, Ohio.

Robert is on a one-third partnership with his father, Roy W. Hendershot, on a 187-acre dairy farm that has cooperated with the Fairfield Soil and Water Conservation District since 1953. There are 74 head of cattle in the dairy herd, and they have 6 brood sows.

With the assistance of the Soil Conservation Service and his vocational agriculture teacher, John T. Ricketts, Robert has planned a complete field layout, crop rotation, and water disposal system for the home farm.

Included in his conservation work has been the establishment of sod waterways seeded to fescue and bluegrass,  $\frac{1}{4}$  mile of multi-flora rose hedge, construction of 2 ponds, 14,000 feet of tile drain-

age, and planting nearly 2,000 trees.

Robert has been an officer of his FFA Chapter, Star Chapter Farmer, and winner of the DeKalb award. He is continuing his study of agriculture at Ohio State University.—PEARL L. FOGLE, *Area Conservationist, SCS, Lancaster Ohio.* ♦

## 1964 Water Year Varies in West

Streamflow during 1964 was near average over the Columbia and Missouri basins according to the fall water supply summary issued by the Water Supply Forecasting Branch, SCS, Portland, Oreg. Elsewhere in the West, however, there were varying degrees of shortage.

Streamflow from the Sierras both to the Central Valley of California and for east slope streams in Nevada was extremely deficient. The 1964 water year in California was the driest since 1954-55.

In summary, total streamflow for 1964 during the snowmelt season was about 105 percent of average for the Columbia River at The Dalles, Oreg., 115 percent for the upper Missouri in Montana, 65 percent for the Colorado into Lake Powell, and less than 50 percent for the Rio Grande. The flow of California's Central Valley streams was roughly 60 percent of average. ♦

## Iowa Farmers Find Self Help Pays Off

**T**HIRTEEN gully control structures and 34 acres of grassed waterways have convinced residents of Big Park watershed in Crawford County, Iowa, that they can overcome the flood and erosion problems which have plagued them over the years.

The structures and waterways represent the work progress on a small watershed program begun in 1960 to combat devastation by gulying on productive Boyer River Valley land.

The project resulted from the efforts of area farmers who organized the Big Park Watershed Association and, after exhausting all local resources in applying conservation measures, sought watershed improvement help from the Crawford County Soil Conservation District.

When an application was approved for Federal assistance through the Watershed Protection and Flood Prevention Act of 1954 a work plan was drawn calling for installation of large-gully control structures to be paid for by the Federal Government.

When completed the project will include 22 structures and 57 acres of grassed waterways. Meanwhile, local farmers are continuing to improve the land with additional conservation practices.—JIM MANDER, *Work Unit Conservationist, SCS, Denison, Iowa.* ♦

## Conservation Films Help Buy Conservation Books

Audubon film showings at Aberdeen, S. Dak., have made possible purchases of 81 books on conservation of natural resources for the public library and two Federal student loans at Northern State College.

The Aberdeen Garden Club sponsored the showings and used the resulting income to buy the books.

Two contributions of \$100 each to the Student Loan Fund satisfied requirements for two \$1,000 Federal loans to worthy students through the National Defense Education Act.

The public library, which moved into a new building last spring, recently was awarded \$1,000 by the Book of the Month Club for outstanding work in the community. ♦





**Waterfowl Tomorrow.** EDITED BY JOSEPH P. LINDUSKA. 1964. U. S. Department of the Interior. Washington, D. C. 770 pp., illus., map. \$4.00.

"Waterfowl Tomorrow" puts between two covers more commentary on the subject than this reviewer has seen elsewhere. Joseph P. Linduska, editor, and Arnold L. Nelson, managing editor, have included writings of more than 100 contributors in this book illustrated by Bob Hines. Wide coverage is given field observations, research, regulatory measures, conservation effort, resource manipulation, and numerous other facets of waterfowl conditions on the North American continent.

The intended audience appears to include the complete range of interests in the subject: Novice, naturalist, student, conservationist, policy maker, and biology specialist. The content is a mixture of poetry, catchy chapter headings, descriptive writing, argumentation, field notes, and interpretative research reporting. Anyone with any concern for waterfowl will find the book interesting reading and a handy reference.

The professional soil and water conservationist will find that much of his work contributes to the welfare of waterfowl. Throughout the book the point is made that agronomic practices used in modern conservation farming provide a major share of the food consumed by the more abundant species.

Water manipulation by engineering structures is credited for its contribution to waterfowl habitat. But many drainage efforts are deplored for their deleterious effects in nesting areas.

Properly constructed and managed farm ponds, lakes, and marsh areas can provide new breeding,

nesting, and resting areas within, as well as beyond, natural ranges of the species. Vegetative practices, including natural as well as improved plant species and varieties, can influence production and orderly harvest of waterfowl.

Every duck and goose hunter who reads the book should better understand the contribution to his sport of farmers and ranchers who practice good land use and conservation of land and water resources.—LLOYD E. PARTAIN, *Assistant to the Administrator*.

**Soil and Water. Volume 1, Number 1.** September, 1964. Published by the Soil Conservation and Rivers Control Council of New Zealand. Wellington, N. Z. 24 pp. and cover, illus. No price indicated.

This first issue of a new soil and water conservation magazine undoubtedly will prove to be a milestone in the progress of conservation around the world. Experience with our own *Soil Conservation* magazine, which it resembles, suggests that the people of New Zealand will be stimulated to greater achievements in land and water husbandry by this new medium of communication.

The first issue contains experience stories and informational articles about many subjects that would seem quite at home in our magazine: Regrassing eroded pastureland, a river flood control scheme, plant materials center, hydrology, and use of fertilizers.

The issue also takes note of the visit of Administrator D. A. Williams to New Zealand to consult with authorities about the administrative organization needed to carry forward the expanded conservation and land use programs in that country.

## New Publications

**How To Plan a Shooting Field in the Northeast and Corn Belt.** BY PHILIP F. ALLAN, OLAN W. DILLON, JR., AND H. GRANVILLE SMITH. 1964. U. S. Dept. Agr. Leaflet 532. 8 pp., illus. One or more good "shooting fields"

where game birds can be released shortly before the hunt is an essential feature of a successful shooting preserve. This guide gives practical suggestions for the layout of such a field to minimize loss of birds and give the hunter a safe, pleasant outdoor experience. It recommends desirable crops, grasses, and shrubs for the Northeast and a sample plan map illustrates an effective arrangement of different kinds of cover within the field.

**Focus on Resource Conservation:**  
**I. Outdoor Recreation: Its Impact Today.** 48 pp., illus. \$1.00. **II. Using and Managing Our Water Resources.** 40 pp., illus. \$1. **III. Policy in Land Management: A Symposium.** 11 pp., illus. 50¢. 1964. *Soil Conservation Society of America, Ankeny, Iowa.* This series of brochures on conservation subjects consists of selections of related articles previously published in the *Journal of Soil and Water Conservation*. They will prove convenient for reference by professional conservationists, for use in schools, and by others interested in specific aspects of the resource field.

**Action for Outdoor Recreation for America.** BY CORC (*The Citizens Committee for the Outdoor Recreation Resources Review Commission Report*). 1964. Washington, D. C. 37 pp., illus. 25¢. A revision of an earlier digest of the ORRRC Report with added information about the Land and Water Conservation Fund Act of 1964 and examples of State and local action.

**Some Training and Services Needed in Agriculture.** BY PROCTOR CAMPBELL. 1964. U. S. Dept. Agr. Misc. Pub. 966. 13 pp., illus. This analysis of commodity use and production patterns in rural America and related needs of farmers for training will be of interest to those concerned with economic development.

**Growing Loblolly and Shortleaf Pine in the Mid-South.** BY CHARLES X. GRANO. 1964. U. S. Dept. Agr. Farmers' Bul. 2102. 25 pp., illus. How to size up woodlands, apply needed practices, and market timber.

**Protecting Trees Against Damage from Construction Work.** 1964. U. S. Dept. Agr. Agr. Inf. Bul. 285. 26 pp., illus. Hints about an important problem in suburban and other construction

**16 Plants Poisonous to Livestock in the Western States.** 1964. U. S. Dept. Agr. Farmers' Bul. 2106. 49 pp., illus. Descriptions of plants and suggestions for reducing livestock losses. ♦



From the Administrator:

## *Good Management*

**A**LMOST everyone knows, from reading the daily newspaper, that the Federal Government is making considerable efforts to reduce its cost and increase its efficiency. Taxpayers—all of us—are keenly interested in these efforts, since we have both a civic and personal interest in better and less expensive Government.

Recently, in responding to a request of the Secretary of Agriculture, we reviewed the gains made in management by the Soil Conservation Service in the past 4 years. I was agreeably surprised to find the total value of these to be almost \$60 million. I felt especially good about this huge sum because I knew also that countless small improvements of great variety made by many field offices had not been counted—mostly because of the cost of collecting the information, to say nothing of field frustration over any more reports.

Very roughly, these improvements amount to an average of about \$15 million a year. And, I'm sure that all conservationists would be delighted to see an increase of this amount in the SCS budget. Actually, that's just about what this amounts to.

What it means in addition, though, is that people in the Service have been exerting themselves to get their jobs done at the lowest possible cost—always, I hope, without sacrificing quality! This is an effort to stretch the budgeted dollars—and a \$15 million stretch is something every man and woman in the Service can be proud of.

The values accrued in many ways. I don't want to leave the impression that these were "savings"—a popular, but much misused word. They were costs we avoided, or more services we provided at no increased cost, or shifts

in time spent on a less necessary activity to an activity of greater importance. Let me illustrate some of them:

Men in work units reduced the amount of travel in providing technical services to land owners and operators. They did this by planning and scheduling their travel more efficiently than before. The total value of the reduction translates to the equivalent of 174 man-years of time or about \$1,131,000. This was in 1963. In 1964 we didn't collect comparable figures, but Service-wide we reduced expenditures for travel by 15 percent, a net reduction of \$632,000.

In 1963 the value of the increased technical services made available to land owners and operators amounted to more than \$7 million—at no increased cost to the Government. In 1964, the value amounted to more than \$11 million.

We consolidated five training centers into four, and realized \$42,700 that could be diverted to other work. We avoided a cost of about \$86,000 by using a correspondence (home-study) course in management, instead of trying to bring the men to a training center.

We are widening slightly the span of control of our area conservationists. They formerly supervised an average of about 8 work units each. Now they're supervising nearly 12. That is, fewer area conservationists are now doing more—and the change adds up to about \$350,000 worth of personnel time now devoted to other kinds of work.

Our progress reports tell us that we have not reduced the effectiveness of our work by these economies. With hardly any increase at all in the total manpower or funds expended, we have given help with more farm plans, more watershed

projects, more Great Plains contracts, and the establishment of more conservation on the land than in the year before.

The percent of land owners and operators receiving assistance from SCS who responded by applying one or more conservation practices to the land increased from 64.2 percent in 1963 to 67 percent in 1964. What better test could there be of the effectiveness of our service?

Of very great importance are the funds contributed by States for soil survey work, watershed planning parties, and assistance to districts. Full credit must be accorded to the many State governments for their cooperation in these respects. These are costs the Federal Government does not have to bear, and they aggregate some \$7 million a year.

We have realized several million dollars by cutting down desk audits, reducing records and filed documents, reducing inspections, eliminating many reports that had outlived their usefulness, and using computers for reporting as well as for watershed planning and for helping design storage capacities of floodwater-retarding structures.

This is a good record, and one I am proud to publish. It took imagination and good hard work to achieve it. And it hasn't faltered, nor, in my judgment, is it likely to.

I look forward to greater achievement with all the men and women in this Service of ours, and with the cooperation of soil conservation districts, State governments, and many others.

Conservation denotes efficiency in land and water use. It is highly appropriate that this efficiency also permeates the structure and operation of the SCS.

—D. A. WILLIAMS.



If your address changes, please notify us of your complete new address, including Zip Code number and include old address with our code number as shown above.

## Sagebrush Gives Way To Tall Grass

**R**OBERT Wangsgard, a Huntsville, Utah, rancher, is proud of his results and his role as a pioneer in control of sagebrush by spraying.

It was in 1960 that Mr. Wangsgard first sprayed 500 acres. At that time he used a fixed wing aircraft. Since then he has used airplane and helicopter with good results.

At one time the sagebrush stood taller than the hood of a jeep and now, 2 years since it was sprayed, the grass is that tall.

The Huntsville pioneer became a cooperator with the Ogden Valley Soil Conservation District in 1960 and received planning assistance from the Soil Conservation Service. The sagebrush spraying was one of several measures adopted in his ranch conservation plan. Good conservation is paying off for a rancher who "... can't afford to have sagebrush growing when the same area can produce grass for livestock." — JOHN K. HORTIN, *Work Unit Conservationist, SCS, Panguitch, Utah.*



Robert Wangsgard (r., above) and his father Louis stand where sagebrush grew before it was sprayed. Now the area is covered with wheatgrass, Kentucky bluegrass, and Letterman's needlegrass. Below, Robert measures flow from one of his stock-water developments.





16  
035  
U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

# Soil Conservation

JAN 29 1965

CURRENT SERIAL RECORDS

FEBRUARY, 1965

VOL. XXX, NO. 7



CONSERVATION ON PRIVATE RANGELAND:

*SCS Range Surveys*—Page 147

*Brush on the Range*—Page 150

*Modern Cattle Drive*—Page 155

THE LAND AND WATER CONSERVATION FUND—Page 161



# Soil Conservation

## *Realistic . . .*

When SCS in the '40's moved away from livestock carrying-capacity estimates to a site and condition inventory as the basis for range planning, it gained increasing confidence of ranchers because experience proved the soundness of judgments based on realistic principles of ecology.

Our range technology takes an equally big step in the '60's in shifting from composition of "standing crop" of forage plants to weight of total annual yield of all plants as the basis for determining range condition.

SCS Range Boss Bill Allred worked with Writer Joe Larson and your editor to prepare an explanation (p. 147) of the new national method of range surveys.

**New Aid:** Soil conservation districts, as agencies of local government, are eligible to receive grants-in-aid from the new Land and Water Conservation Fund (p. 161) to help pay for *public* recreation developments.

District officials should not miss the opportunity to participate in State and local plans for outdoor recreation to be prepared under the direction of the Bureau of Outdoor Recreation.

**Cover:** The Roy Houck trail drive (p. 155) winds over the hills to winter range on his conservation ranch at Standing Butte, S. Dak.



## CONTENTS:

- 147 SCS Range Surveys**  
Annual yield of all plants is new basis
- 150 The Texas Brush Problem**  
Resurvey of rangelands after 15 years shows increase  
*By H. N. Smith and C. A. Rechenthin*
- 152 Lana: A Vetch for the West**  
Versatile legume thrives on many sites  
*By H. W. Miller*
- 155 A Modern Cattle Drive**  
South Dakota rancher takes to the trail  
*By Dwaine C. Smith and Herbert R. Davis*
- 159 Rancher Makes a Showplace on Private and Public Land**  
*By Edwin P. Engle and John O'Hayre*
- 160 Narrow Strips, Grass Cover Win Favor With Farmers**  
*By Walter J. Guernsey*
- 161 Land and Water Conservation Fund Can Aid Local Recreation Plans**  
*By Henry F. Nichol*
- 163 A Conservation Plan for County Roadsides**
- 164 Profile**  
Nolen J. Fuqua: Life of Public Service
- 165 Preservation of Natural Beauty**  
*By Gladwin E. Young*
- 166 Review**  
Man and Land in the United States; North Carolina Lands; Wildlife on the Public Lands
- 167 From the Administrator**  
Range conservation; New Zealand lessons
- 168 More and Better Grass Pays in Great Plains**

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

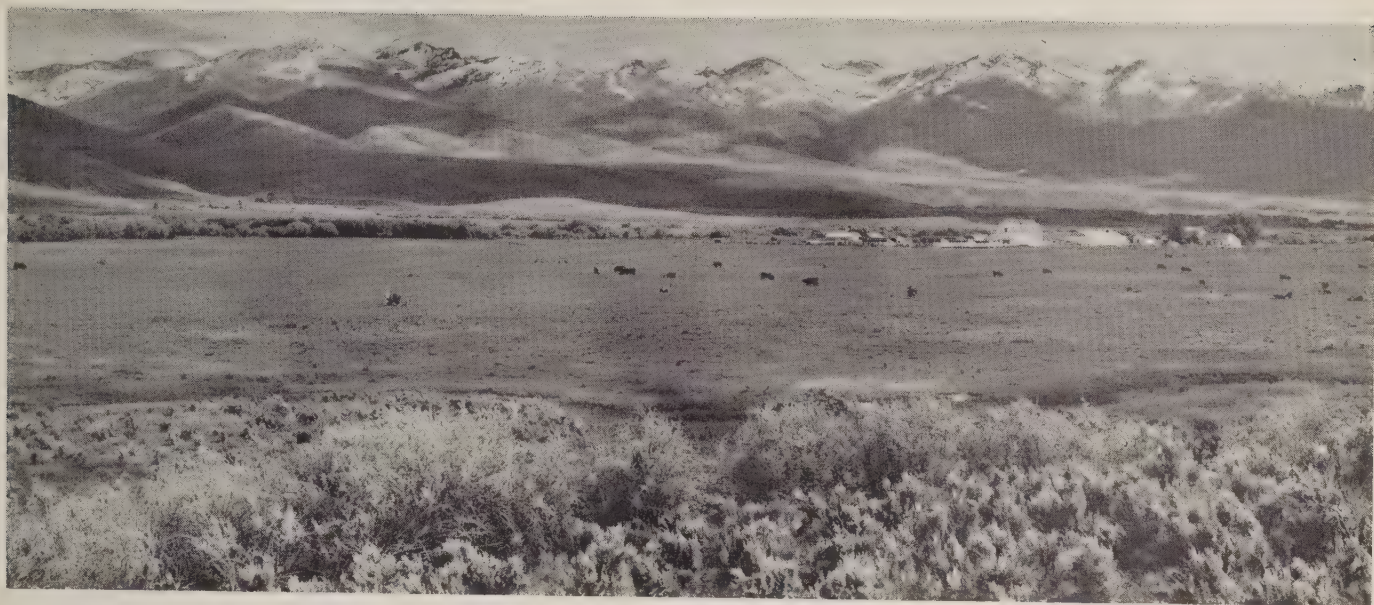
Editor  
BEN O. OSBORN

Editorial Assistant  
GEORGIE A. KELLER

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Photos available on request.  
**Commercial names:** Mention of commercial enterprises or brand names does not constitute endorsement by the Department of Agriculture.

**Subscriptions:** \$1.50 per year, \$2.50 foreign. Single copy, 15 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.





RANGE conservationists in the Soil Conservation Service are shifting to a uniform system of surveys that provides basic data for planning all possible uses of each range area — not just livestock grazing.

Two features of the new national system differ from procedures used in the past:

(1) It accounts for all parts—leaves, twigs, flowers, fruits—of all kinds of plants in the range cover, whether or not they are useful as livestock feed or are within reach of stock.

(2) Amounts of vegetation are measured or estimated as air-dry weight per acre of a year's growth—the annual production—exclusive only of enlargement of stems of trees and shrubs.

### Standard Classification

For years SCS has used a standard method of classifying ranges by sites and conditions, described in the publication "Classifying Rangeland for Conservation Planning" (USDA Agr. Hbk. 235).

But range men in different parts of the country variously determined the composition of the veg-

## SCS Range Surveys

**Weight of annual yield of all plants  
is new basis of judging condition**

etation—the necessary prerequisite to determining condition — on the basis of weight of forage per acre, or percentage of ground surface covered by the canopies of different species, or the basal areas of stems, or other theoretical measures.

Most, but not all, surveyors estimated the total quantity of vegetation on the land—the "standing crop"—as they visualized it at the end of the growing season. Some considered only that within reach of livestock, others considered the total cover.

The national system will continue to classify rangeland by the site and condition system that has proved itself in practice. But all

descriptions and comparisons of vegetation will be in terms of *weight of annual yield of all parts of all plants.*

### Toward Uniformity

The system not only will encourage uniformity between States and regions; it will provide information for judging suitability of each range site for other uses besides grazing—for wildlife, recreation, watershed protection, or any other in which the operator might be interested.

All the range States have now adopted the new method. All are either using it or making the transition to it. It is being introduced



to States that have given little attention to natural pastures in the past.

The system is the result of 30 years' experience in working out conservation plans with more than a half million ranch operators, combined with practical applications of exacting research techniques.

B. W. Allred, head range conservationist of SCS, says the new system produces a far more accurate and detailed analysis of range resources and conditions than previous ones.

For the district cooperators, it provides a broader base for choosing between alternative range uses and a more precise guide to the conservation needs of the land.

### A Versatile Tool

For the range conservationist, it means a more versatile tool in range analysis, one that can be checked by mechanical means, and one that permits correlation of

range descriptions across the State lines.

In making surveys under the new method, SCS has borrowed a technique from research scientists, who for years have measured yields by actually harvesting and weighing the herbage produced on test areas.

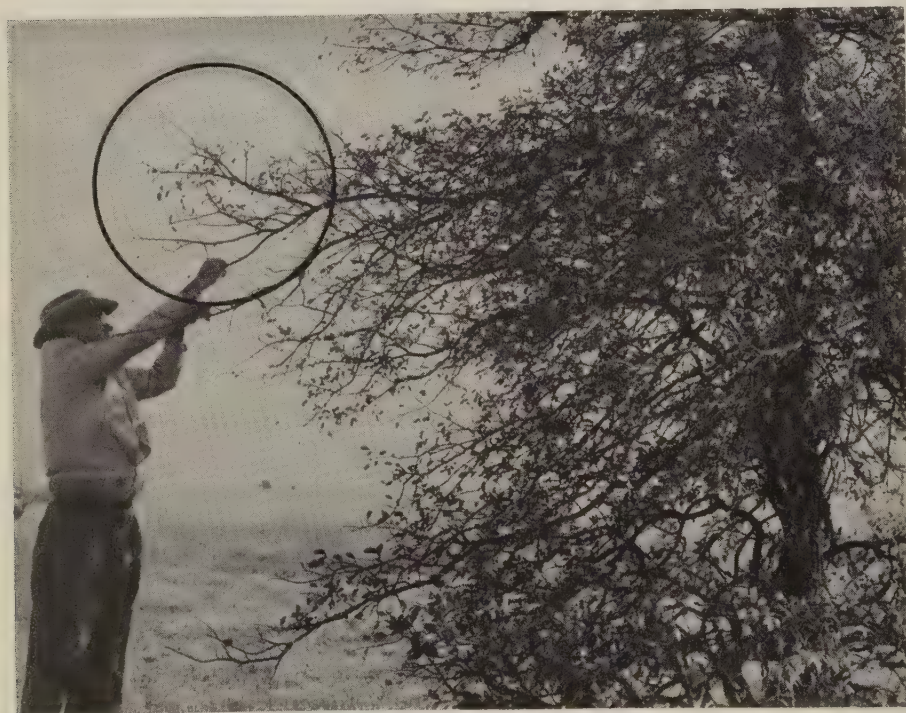
Use of this technique has to be learned through training and practice. But, once he learns it, the conservationist can survey range as rapidly as by previous methods. Moreover, he can check his judgment at any time by cutting and weighing samples of the vegetation within a measured area.

In the resulting weight estimates, the cooperator has an understandable measure of the productivity of his different range sites. And he has meaningful figures to compare his present yields with potentials, or with those of his neighbors.

The "weight of yield" survey tells the rancher how many pounds



The annual production of pricklypear cactus is mainly in the form of fleshy fruits. They are gathered and weighed to determine the plant yield of this species.



To check his estimates of weight of plant yield of woody species, the range conservationist selects a "weight-unit" of suitable size (indicated by the circle), strips off the current year's growth of leaves and twigs, dries them, and weighs them. While in the field, he determines the average number of equivalent weight-units per tree or shrub and counts the plants on a sample area (e. g., 100 feet square).

or tons of good livestock forage his range produces—in the same terms he is accustomed to using in thinking of the yield of hayfields or croplands.

It also tells him, in the same terms, how much wildlife food is produced and how much total cover is available to protect the soil from erosion and conserve rainfall. He can compare the amount of the plant yield within reach of livestock and game and that out of reach. He has facts about plants important for recreation uses or other purposes.

When requested, the SCS conservationist helps a district cooperator evaluate his resources and make a complete conservation plan for his ranch. As they examine the conservation needs of the property together, they map out the range sites on an aerial photograph.

The range survey information enables the rancher and conservationist to classify the condition of



## Example of Range Inventory

<i>Plant species</i>	<i>Maximum percentage in climax</i>	<i>Percent of present vegetation</i>	<i>Percentage used in determining range condition</i>
<b>Decreasers:</b>			
Sand bluestem.....	No limit	5	5
Sideoats grama.....		15	15
Little bluestem.....		10	10
Switchgrass.....		Trace	
<b>Increasesers:</b>			
Blue and hairy grama.....	25	20	20
Sand dropseed.....	5	10	5
Perennial forbs.....	5	Trace	
Sand sagebrush.....	5	10	5
*Havard's oak.....	10	20	10
<b>Invaders:</b>			
Annuals.....		10	0
Cactus.....	None	Trace	
<b>Total</b>	<b>100</b>	<b>100</b>	<b>70</b>
Total plant yield: 4,000 pounds per acre			
Condition class: Good			

\*One-tenth of oak is out of reach of cattle until acorns and leaves fall.

each range area on the basis of the percent of present vegetation that is "climax" for each site.

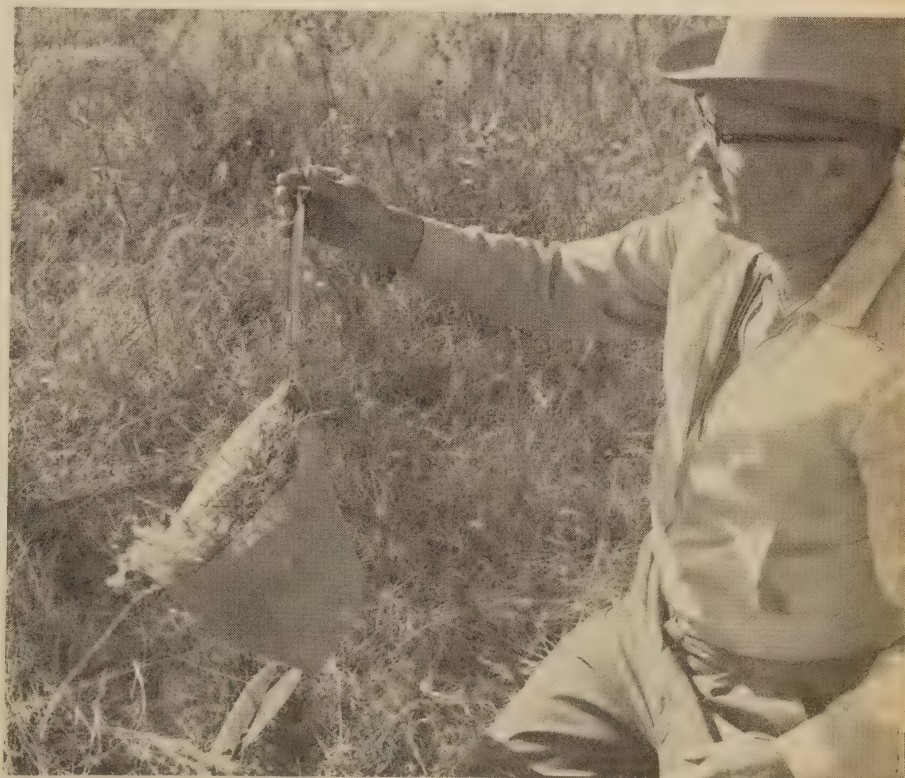
The different kinds of plants in the present cover are grouped according to their potential presence on the site and their response to grazing as: (1) *Decreasers*, species that are important in the climax cover and that decrease in relative abundance under heavy grazing; (2) *increasers*, species that are present, but of minor importance, in the climax cover and that increase in abundance as the decreaseers decline; and (3) *invaders*, species that are not present in the climax but that come in and grow along with the increasers as the decreaseers are reduced by grazing.

The four condition classes are recognized by the percentage of the present cover made by decreaseers plus the small amounts of increasers considered normal in the climax or potential cover. The standards, which have been used by SCS for several years, are: Excellent, 75-100 percent climax; good, 50-75 percent; fair, 25-50 percent; and poor, less than 25 percent.

When completed, this map, in conjunction with the soil map, shows which land can best be used for range, tame pasture, cropland, meadow, woodland, wildlife, recreation, or combinations of these.

## Rancher Decides

The rancher then decides on changes to be made in the ranch enterprise and determines the feed crops needed for livestock and wildlife. He also decides which fields are to be used for crops and where tame pastures, meadows, windbreaks and holding lots are to be.



Grass is cut at ground level within a measured plot (marked by the steel band in this case). The current year's growth is separated from older material, dried, and weighed.

Contrary to a common belief, the range site and condition inventory is not made to determine grazing capacity of the range. Range condition, as used by the SCS, is the present state of the vegetation compared with the best (usually the climax) capable of growing on each site.

Classifying range condition provides an approximate measure of any deterioration that has taken place in the plant cover and, thereby, provides a basis for predicting the degree of improvement possible.

Although SCS does not determine stocking rates directly from range inventories, the local conservationist suggests an initial stocking rate for each range condition class on each range site based on a combination of local records and experience. These suggested rates are set forth in range technical guides of the work units.

Because of seasonal and annual variations in forage production, it

(Continued to p. 162)



# The Texas Brush Problem

**Resurvey of rangelands after 15 years  
shows woody plants continue to increase**

By H. N. Smith and C. A. Rechenthin

*State Conservationist and Soil Conservationist, SCS, Temple, Tex.*

A "population explosion" of undesirable woody plants on the grasslands of Texas continues in spite of widespread efforts and millions of dollars spent in combating the brush.

A resurvey of the brush problem in Texas by the Soil Conservation Service in 1963, as a followup to one made in 1948, revealed that many species are still encroaching on new areas as well as increasing on land already infested.

Mesquite has increased by 1¼ million acres in the last 15 years and is now found on 56½ million

acres.

The junipers, locally called "cedars," have spread to an additional 3½ million and now cover more than 21½ million acres.

Huisache, retama, cactus, whitebrush, saltcedar, and Macartney rose also are encroaching on native grasslands at an alarming rate.

## 82 Percent Affected

A total of 88½ million acres, or 82 percent, of Texas grasslands were found to be infested with woody plants of some kind, either in pure stands or in mixtures. Fifty-four million, or 50 percent, are so densely infested that soil and water are being wasted in the production of nonusable vegetation, erosion is often serious, and useful forage production is so low that profitable ranching is threatened.

Less than one-fourth of Texas grasslands have 50 percent or more of the desirable forage plants remaining and can be rated in good or excellent condition. At least 30 or 35 percent are in poor condition, having little grass cover. Major and costly treatment is necessary to control the woody plants and restore the land to profitable production.

## Some for Wildlife

At least 50 different kinds of woody plants have invaded or increased on Texas grasslands so that they have become serious problems.

Some of them are good browse and wildlife food plants, but they have increased to such dense stands



Erosion cut the ground out from under a mesquite tree in poor condition range.

that they drastically interfere with the production of other desirable forage plants. Preservation of wildlife habitat areas rather than complete removal of brush is a necessary part of sound planning for brush control.

## Only One Step

Brush control is only one step in the restoration of grasslands, which must be done in a planned, systematic program if it is to be fully effective. Other essential steps are reestablishment of good forage plants, control of brush reinfestation, and management of grazing to maintain a vigorous stand of grasses.

More than 30 million acres of brush have been treated in the past several decades, some of it two or three times, but reinfestation from root sprouts and seedlings has nul-



Acacia, cactus, and other chaparral offer a poor diet for livestock and rob the grasses of needed moisture.



lified the treatment on most of it in 4 to 10 years.

The Soil Conservation Service estimates that treatment is still effective on only about 15 million acres, much of which is becoming reinfested and soon will need re-treatment. Ranchers are hardly holding their own in the fight against brush.

### A Costly Operation

Controlling undesirable brush is a complex and difficult operation, as well as expensive. Costs range upward from a low of about \$3 an acre. Complete treatment for some thickly infested grassland, which may include treating the brush, raking and burning, seeding, fencing, and other measures, sometimes requires an outlay of \$15 to \$35 an acre. The cost alone prohibits many operators from carrying out a control program, even though the Federal Government makes limited cost-sharing available.

Both mechanical and chemical control methods are being used extensively in Texas. Goats as browsing animals are becoming more important in the control of sprouts and reinfestation.

Bulldozing is the most effective mechanical control method but its



A "grandpa" mesquite lords over its progeny on an area that was open prairie 20 years ago.

cost limits its use to small areas or tracts with scattered trees.

Rootplowing is the most practical and effective control for thick stands of brush where there is little grass and the area needs reseed-ing. This method is particularly adapted to mixtures of brushy species, some of which are resistant to chemicals, or to stands too thick to be effectively treated otherwise.

A problem associated with root-plowing has been the difficulty of getting stands of grass, especially native species, in some parts of the State.

Good stands of buffelgrass and

blue panicum and natural recovery of native grasses have usually been obtained in south Texas, but results have often been poor elsewhere.

### A Seedbed for Grass

The rough, cloddy condition of the surface after rootplowing seems to be an unfavorable seedbed for some grasses. Firming and smoothing the surface by chopping, rolling, or dragging with a heavy chain before seeding have resulted in much better stands. Some ranchers use a front-end rake on a tractor to stack the brush, thereby smoothing and firming the seedbed. This has helped to obtain successful stands of grass.

Another problem with rootplowing in south Texas has been the subsequent spread of pricklypear cactus and whitebrush. These plants have rapidly reinfested some treated areas in a few years so that they create as big a problem as the original cover. Some ranchers have used raking to control reinfestation with good results.

Railing is another method increasingly used to control the spread of pricklypear. Ranchers use a heavy tandem drag made of railroad rails welded together in two's or three's to crush the pricklypear pads. Cattle are usually turned into the freshly railed areas



Conservative grazing after brush control allows native grasses to increase. Scattered shrubs and brush piles provide shelter for wildlife.



to eat the broken pads and prevent their taking root.

Kerosene applied to the base of mesquite and several other species is effective, but the difficulty of application and cost of labor restrict this method to small areas or scattered trees.

The hormone herbicides, 2,4-D, 2,4,5-T, and 2,4,5-TP, are widely used in brush control. Mesquite, shin oak, post oak, sand sagebrush, and other susceptible plants are hand-sprayed around the base when in small areas, or by airplane or helicopter in large areas. Although top kills generally are as high as 80 or 90 percent, root kill is often as low as 5 or 10 percent. The erratic results and the hazard of drifting spray to nearby crops have limited the use of aerial spraying.

### Inverted Emulsion

One of the newest and most promising advances in the use of herbicides in aerial spraying is the development of an "inverted" emulsion which greatly reduces the drift hazard to crops. The inverted emulsion in which the herbicide is suspended has a consistency somewhat like mayonnaise. The jelly-like droplets fall nearly straight down from the plane or helicopter.

The use of goats to control woody species and sprouts on treated areas is becoming more common. Goats naturally use browse as a large part of their diet and will defoliate woody plants as high as they can reach if enough animals are concentrated on an area.

Effective control of brush is obtained by concentrating goats on a pasture long enough to completely defoliate the shrubs, and then moving them to another pasture. A three- or four-pasture system is most practical for such treatment.

Three years of such treatment will generally reduce the infestation to within desired limits. Goats can also be used in lesser numbers to maintain effective control once it is established. ♦

## Lana: A Vetch for the West

**Versatile legume thrives on many sites in range, pasture, and cropland**

By **H. W. Miller**

*Plant Materials Specialist, SCS, Pleasanton, Calif.*

FROM a few legume seeds on an overgrazed Turkish hillside to more than half a million acres of improved range, pasture, cover crop, and wildlife food—this is the story of Lana vetch.

Lana has become an important conservation plant in 7 Western States and 3 foreign countries, and promising results are reported from 10 other nations on 4 continents.

Lana, Spanish for "woolly," is the name given an improved strain of woollypod vetch developed at the Soil Conservation Service Plant Materials Center at Pleasanton, Calif. Seed originally was gathered from a plant growing on an eroded, overgrazed hillside near Adana, Turkey.

The California Department of Conservation, the California Agri-

cultural Experiment Station, and the SCS plant materials center all had a hand in Lana's development.

Lana first began to show promise in the early 1950's and was approved for certification and released for standard use in 1957.

Reasons for Lana's popularity are many. They include the systematic plant improvement program of SCS that made rapid testing and spread of practice possible. But the biggest factor is the legume's versatility.

### Range Forage

A major need in the West has been a reliable legume for improving the quantity and quality of range forage. Forage that is at least 30 percent legume will produce more meat or milk than one



Lana vetch mixed with Blando brome provides good erosion-preventing cover on the Adobe Creek watershed dam in the West Lake Soil Conservation District, Calif.



that has no legume. But keeping legumes in the stand is a problem.

Lana stays when fertilized, whether the rainfall is 8 inches or 30 inches. And it makes up to 30 to 40 percent of the forage. This has meant about \$12 million additional income from livestock to California ranchers alone, says Dr. A. L. Hafenrichter, SCS plant materials specialist for the West.

Lana spreads rapidly from original seedings, both by accident and by design. As one travels north from the Mexican border through California and western Oregon during late April and May, Lana is almost continuously in view. Its bluish-purple flowers and sprawling green growth are in evidence on the roadsides, in neighboring orchards, fields, and ranges—wherever a seed has a chance to lodge. Cattle, sheep, horses, and goats all take it readily when it is green, and relish it so much that the ground often is licked bare after Lana is dry.

### Green Grazing

Frank Nissen, a sheep rancher in the Western Yolo Soil Conservation District, Calif., gets longer green grazing for his ewes and lambs with Lana, and it is one of the few dry feeds his sheep will graze. He has seeded Lana on his hilltops so it will creep down the slopes too steep to plant.

SCS Agronomist D. G. Craig says, "We made a start on Lana vetch in the Southwest with the few pounds of seed I scrounged on a trip to the Northwest several years ago. Starting from this with an additional small seed order later on, we have the legume growing all over east Texas and Oklahoma to the tune of several hundred thousand acres each year. It is doing a good job as a winter cover crop and also gives lots of good winter grazing."

Another area in which Lana shows real promise is in control of Medusahead, a serious pest on western ranges. Medusahead is a weedy,



**This unfertilized stand of Lana vetch yields twice the forage of other range; with 200 pounds an acre of 16-20-0 fertilizer, yields can be tripled.**

annual grass that invades and spreads rapidly over poor-condition rangeland, crowding out better forage species. Its feed value is very limited. When seeded and properly fertilized with phosphate, Lana overtops and suppresses the weed as well as providing nutritious range forage.

Lana also helps improve quality of grazing in aftermath stubble of grain fields. Perhaps most important is the self-seeding ability of Lana. In the Upper Salinas Soil Conservation District, Calif., Bill Gerst reports that the vetch has volunteered and provided grazing in alternate years in the same field.

### Food for Wildlife

Lana vetch is a boon to the newest phase of the conservation program — income-producing recreation. Wherever Lana occurs, concentrations of doves and quail can be expected. Deer, rabbits, and other smaller game like it too; they feed on the seed as well as the foliage.

In the Northern Sacramento Valley of California, a group of 20 sportsmen paid Melvin Hans \$500 to shoot doves on his Lana vetch

rangeland.

In the Western Shasta Soil Conservation District, Cooperator Bill Ryne reported that his Lana vetch seeding not only attracted hundreds of doves, but also made them stay all winter instead of migrating.

### Doves Like It

Food habit studies of the California Department of Fish and Game show that Lana vetch seed and new seedlings are a preferred food. Lana occurred in 10 of 19 dove crops analyzed. Volume of use ranged up to 94 percent and averaged 34.5 percent of the crops' contents.

In September 1963, 187 mourning doves were collected near a 2-acre Lana vetch seed production field. Lana had been the principal food of 169 of them.

Use of Lana for food by quail and pigeons also is authenticated. Ed Campodonico in the Arroyo Grande Soil Conservation District asked Department of Fish and Game Warden Johnson why valley quail were increasing on his ranch. Doves, too, lingered long in this area for the first time. Discussion



disclosed that Lana vetch had been planted in a badly eroded field in 1955. Although there had been no other cultivation or reseeding done, the vetch had spread a lot, and examination of doves and quail proved they were utilizing Lana seed.

More than a thousand doves were seen on a 3-acre Lana range seedling near Sunol on February 26, 1962—when most doves would have long since migrated. California quail have increased on the Pleasanton Plant Materials Center from a single pair to a flock of more than 100 birds. They feed on the harvested Lana seed fields each summer, fall, and winter.

Now, with more than 300,000 acres in California alone in Lana, its value for upland game and recreation is being realized.

### Other Uses

Lana vetch mixed with Blando brome provides reliable cover in disturbed areas in small watershed projects and stabilizes banks. It also is effective as a cover and green manure crop in orchards. Bees like it, too, and Lana vetch honey is attracting considerable attention.

Lana vetch has taken its place as a versatile and reliable conservation plant. Of the 20,000 plants tested at Pleasanton, it is one of the best.

As Carlos Corvetto from Chile, who began with 1 pound of seed and 3 years later had 30 acres planted on his Chequen farm near Concepcion, put it: "She is . . . really wonderful." ♦

## Christmas Trees Make Gully Plugs

BOY Scouts of Troop 24, Whitehall, Mont., use old Christmas trees to help control soil and water losses.

Several years ago George Capp, rancher and cooperator of the Jefferson Valley Soil and Water Conservation District, asked the Scouts

to help him plug some gullies and stop soil from washing down into his irrigation canal.

He suggested that instead of burning old Christmas trees they put them in the gullies to check erosion.

Every year since then, the Boy Scouts have made a conservation project out of their community Christmas tree cleanup. Bob Fleege

of the Soil Conservation Service, Patrol Dad of the Falcon Patrol, and Mr. Capp decide where the trees will be placed.

This community service not only helps rid the town of the trees, but it also gives the Scouts some firsthand, practical experience in the conservation of soil and water.

—ROBERT L. ROSS, *Range Conservationist, SCS, Butte, Mont.* ♦

## Trees Planted on Shaft Mining Land

A tree-planting program promotes conservation and new productivity for mining land in the Williamson County Soil and Water Conservation District in Illinois.

The Madison Coal Company of Carterville has started the program on cropland that it purchased in 1900 for shaft-mining. The last of the mines were closed in 1931. The land had been rented to local farmers on an annual cash basis, giving little incentive for conservation.

With the aid of a soil survey made by the Soil Conservation Service and the University of Illinois, the company has made plans and decided on which trees to plant. It obtained planting stock

from the Illinois Department of Conservation. The first planting was 300,000. To date more than half a million have been planted.

The first cutting will be made in 12 to 15 years and will be used for pulp. Subsequent cuttings will be made every 4 years until after 25 years, when trees are expected to be large enough to market for telephone poles.

"This is a big step forward in soil and water conservation in our district," says John M. Biehl, chairman of the district. "Mine companies own a big percentage of the land in our district."—SILAS W. BROWN, *Work Unit Conservationist, SCS, Marion, Ill.* ♦

## Range Management Society Holds Rancher Key to Conservation

"The Rancher—The Key to Range Management" is the theme of the eighteenth annual meeting of the American Society of Range Management, to be held February 9 to 12 in Las Vegas, Nev.

Speakers will discuss a wide variety of subjects pertinent to the grazing industry, according to President Wayne Kessler.

Since it was organized in 1947 at Salt Lake City, the Society has grown to nearly 5,000 members. They include ranchers, farmers, teachers, researchers, commercial seedmen, and members of action agencies and the land administer-

ing bureaus who are interested in grassland science and practice.

According to its credo in the masthead of its *Journal of Range Management*, "The American Society of Range Management was created in 1947 to advance the science and art of grazing land management, to promote progress in conservation and sustained use of forage, soil and water resources, to stimulate discussion and understanding of range and pasture problems, to provide a medium for the exchange of ideas and facts among members and with allied scientists, and to encourage professional improvement of members."



# A Modern Cattle Drive

South Dakota rancher takes to the trail  
to conserve beef, money, and grass

By Dwaine C. Smith and Herbert R. Davis

*Range Conservationist and Work Unit Conservationist, SCS, Pierre and Ft. Pierre, S. Dak.*

**"H**HEAD 'em up! Move 'em out!" shouted "Trail Boss" Roy Houck and the drive was on.

It was late summer and time for Rancher Houck to move his 2,000 head of cattle to 50,000 acres of winter range at Triple U Ranch at Standing Butte in central South Dakota. The grass on the Akaska ranch operated by Houck and his son, Jerry, had been grazed to its conservation limit.

Houck learned long ago the value of good grasses to his ranching. Both he and Jerry are cooperators with the Stanley County Soil and Water Conservation District.

## The Drive Begins

Houck is a firm believer in the conservation rancher's rule: "Take half and leave half." This was one of the reasons behind his cattle drive.

The sun was just sliding up above the flat rolling plains the

day Houck rode out among his herd and worked the lead critter out in front, just as in the big trail drives years ago when herds had a leader to start walking so the other cattle would follow.

It would take a day or so for the herd to become trail-broken and the cattle realize they were supposed to keep moving every day behind the leader.

The half-dozen cowpokes, including Houck's two sons and young daughter, formed a circle around the herd which had spread out over miles forming a long narrow column, and they were ready to start pushing west.

Overland trail drives hadn't been done in a good many years. But such drives are not new to Houck, a former lieutenant governor of South Dakota. In 1934, to escape grasshoppers and drought, he took part in a 200-mile drive with neighbors in moving 1,000 head of cattle from South Dakota to Nebraska.

Driving meant less shrinkage and less danger of disease; he'd be saving a lot of money by moving the stock overland this way.

## Hard Work

It was work—grueling work—in all kinds of weather. The crew was in the saddle from sunup till sundown. The whitefaced Herefords constantly tried to stop and graze and the cowpokes had to keep swinging their ropes to get them moving again.

The job was to get the herd to Standing Butte all together and in good shape. Each man in the outfit had at least four horses, since a horse must rest once in a while to avoid lameness. A wrangler took the horses on ahead each morning. The 125-mile drive to Houck's winter range took 13 days.

While this modern drive was reminiscent and had much of the color of early-day drives, changes have taken place over the years.



Modern highways and long bridges make Roy Houck's cattle drive different from those of the Old West.





The chuckwagon, full of steaks for the cowpokes, moves on ahead of the herd.

Perhaps the biggest change is today's good grass management. Now the rancher's primary concern is keeping an excellent cover of grass on the range for both livestock use and erosion control. Another big change is in the accompanying chuckwagon.

Drovers no longer are victims of a steady menu of salt pork and beans and sourdough biscuits, flavored heavily with trail dust.

Houck hired two of the best chefs in the area and purchased more than a ton of food so that when the dozen hungry punchers rode in after a day's drive, there was a huge pot of coffee and a platter full of steak on the tailgate of the chuckwagon.

Houck got requests from people all across the Nation wanting to participate in the drive. Only a dozen local cowpokes were actually used, but dozens more newsmen and

Drive pauses while drovers change horses (Houck's son Jerry is at right).





aspiring waddies from the East, South, and West joined for part or all of the drive just to participate in an "old west cattle drive."

### New Difficulties

Although the modern drive is easier in some respects, there still are plenty of difficulties, many not encountered in the early-day drives.

For example, the early drives usually traveled across open country, unhampered by fences, modern roads and traffic, and other encumbrances of modern life.

Planning, in fact, was a major item in the Houck drive. Charting the best course was a difficult problem. Making certain that forage and water were available for a couple thousand head of hungry animals was not easy. Obtaining permission to drive the herd across another man's rangeland, graze his grasses, and drink his water was necessary.

Streams and stock ponds along the way provided the cattle with water. Recent rains made the trail green with grass.

Supplying the cattle with food and water wasn't as much a problem as figuring out how much another man's forage was worth and how wide the drive would be across his land.

Houck figured that his 2,000-head herd would eat approximately 50 animal-unit-months of grass each day, enough to feed 1 mature cow for 4 years and 2 months.

The Cheyenne River was forded in the extreme northwest corner of Stanley County, as close as the cattle caravan could cross behind the backwater of the world's largest earth dam, the Oahe Dam some 60 miles downstream. The current in the river meant some of the prized stock could be pulled downstream. To counter this, some of the cowpokes were posted down river to pick up the Herefords when they came out of the water on the opposite bank.

The mighty Ole Missouri was crossed at the U.S. Highway bridge



Houck and Chief "Olney Runs After" relive custom of trading cattle for right to cross land.

Houck's family and the 12 drivers take a breather in the shade near the chuckwagon.







Rancher Roy Houck, leader of the cattle drive, rounds up some strays.

which spans more than 4,500 feet. This crossing was probably the most unusual spectacle on the drive. The herd, used to prairie sod, was skittish of the bridge and had to be kept moving to prevent bunching or stampeding.

### End of the Trail

It was here that the drive took on much of the color of the early-day drives. A band of Cheyenne Indians in tribal dress staged a dance as part of a traditional ceremony. "Paleface" Houck traded some beef animals to Chief "Olney Runs After" in exchange for permission to cross through the belly-high prairie grass on the reservation.

After crossing the reservation, the drive came to the end of the trail — Houck's Triple U Ranch, with its 50,000 acres of winter range,

managed under a conservation plan with the Stanley County District.

The Houcks worked closely with the Soil Conservation Service in drawing up the conservation plan for the ranch and have spent about \$15,000 a year in applying the practices called for in the plan.

A major part of the plan involves cross fencing and stock-water development, all to insure even grazing of all pastures. Land having inadequate cover has been seeded to adapted range grasses. Deferred grazing and proper range use are practiced to manage these grasses. Some tree shelterbelts have been planted. Houck hopes to complete all the measures in 4 or 5 years.

Other interesting enterprises are being carried out on the ranch. The Houcks are experimenting in cross breeding of Hereford cows with

Charolais bulls. They also are keeping a herd of 40 buffalo, which Houck says is not easy. The Houcks also maintain a high-quality quarterhorse herd, in addition to their annual cow-calf operation of 700 head of breeding cattle and 1,500 to 3,000 head of steers.

### Steer Enterprise

The steer enterprise gives the Houck operation flexibility for good and bad years and helps get proper range use each year. Houck says he may switch exclusively to steers some day since they are easier to handle than a cow-calf operation and are easier on the range.

The Houcks' two-way radio system between the ranch headquarters and every ranch vehicle is in constant use. In addition, both Houcks are pilots. Roy flies mostly on business trips, while Jerry is in his plane almost daily to keep an eye on all the far-flung phases of the Houck operation.

The "cattle drive" is about the only throwback to the early days — and, Houck admits, it has seen some changes over the years. ♦

### Outdoor Recreation Opportunities

Recreation opportunities on the Nation's privately owned farm, ranch, and woodland are virtually unlimited. The simple recreation activities are the most in demand. Some people want to swim, hike, picnic, or fish. Others want to golf, hunt, camp, boat, or just relax. Farmers and ranchers can develop facilities for these activities by proper soil and water management. They can switch over abundant cropland into profitable recreation facilities, develop these facilities on formerly idle areas on their land, or combine recreation and farming on the same land. "Rural Recreation" (USDA Misc. Pub. 930) reports on new opportunities for private land. ♦



# Rancher Makes Showplace On Private, Public Land

By Edwin P. Engle and John O'Hayre

*Work Unit Conservationist, SCS, Gunnison, and Conservation Educationist, Bureau of Land Management, Denver, Colo.*

**T**HE Tomichi Ranch operated by James P. Sloss near Gunnison is rapidly becoming a showplace in Colorado and demonstrates what can be done toward range rehabilitation on an operating unit that includes both private and public land.

In 1959-60, after Sloss acquired the ranch in 1958, the Soil Conservation Service and the Bureau of Land Management technicians, through the Gunnison Soil Conservation District, assisted the new landowner make an inventory of his range resources.

The range was in a low productive state, and some areas were heavily overused from cattle concentrated around available water.

Rancher Sloss decided that a number of range improvement practices should be put into effect as rapidly as possible to get maximum production.

The first step was to enter into a range division agreement with other users and the BLM to establish an individual allotment of 5,460 acres of Federal and 2,660 acres of private land. Heretofore, the Federal range was used in common with five other permittees.

In addition to a soil and water conservation plan, the long range improvement program called for constructing about 13 miles of boundary fence to enclose the allotment, controlling sagebrush, building additional stock-water facilities, and cross-fencing.

During 1961, in cooperation with the BLM and the Gunnison District, 1,360 acres of sagebrush land, of which 736 acres was privately owned and the balance of 624 acres in Federal ownership, was aerial-sprayed. Thirty-two stock-water

springs were developed to provide adequate water and better distribution of grazing.

Proper grazing management was recognized from the start as an essential part of the range rehabilitation program. A 10-year permit issued by BLM in 1959 provided for an annual use of 528 animal-unit months by 176 cattle. In order to accelerate range rehabilitation,

only 263 animal-unit months of grazing was utilized in 1960, and the permittee took the option of nonuse in the 1961 grazing season.

By 1962 the range had improved enough to allow 550 animal-unit months of grazing. For the 1963 grazing season, Sloss was licensed to graze 300 cattle for a total of 864 animal-unit months.

The water developments have proved invaluable in achieving good grazing. The sagebrush kill was estimated to be 95 percent effective, thus providing more favorable growing conditions for grass. Grass production has increased from 200 pounds air-dried forage an acre to about 1,100 pounds an acre on the sprayed area. ♦



Rancher James Sloss is pleased with grass in sprayed area as he makes utilization check at end of grazing season.



Grass recovery is evident in Stubb Gulch area of Tomichi Ranch after spraying and conservation grazing.



# Narrow Strips, Grass Cover Win Favor With Farmers

By **Walter J. Guernsey**

*Conservation Agronomist, SCS, Lexington, Ky.*

**N**ARROW stripcropping patterns and grass cover crops are gaining favor with Kentucky tobacco farmers as refined conservation practices that do more than control erosion.

These modern practices, developed by Soil Conservation Service conservationists working with soil conservation district cooperators, increase profits and produce many

side benefits as well.

Experience has shown farmers that by drastically narrowing tobacco strips in stripcropped fields they can improve the quality of the crop and gain other advantages over earlier methods.

The first year the narrow strips were tried most cultivated strips had 12 to 16 rows of tobacco. Since then the number of rows has been

gradually reduced until now many farmers plant only 4 or 6 rows in a strip. Sod strips equal or exceed the cultivated strips, with a minimum width of 15 feet.

Morris Edmonds, of Russell County, said "I have made from \$100 to \$300 more an acre a year since starting the practice 4 years ago."

One of the benefits farmers note is that crops in outside rows improve in quality and in amount when the sod strips are kept mowed for hay and the natural shelter for grasshoppers and other insects found in fence rows and along field borders is eliminated.

Insect control is reported easier because tractor-mounted spray rigs operate on the sod strips and the spray boom extends out over the tobacco rows. One-half of the rows



O. G. Stephens of the Russell County SCD shows how easy it is to spray his 8-row contour strip of tobacco from the sod strips.



can be sprayed from either side.

Better air circulation between rows and under the tobacco leaves reduces the number of leaves lost from scalding or rotting during hot humid weather. The sod or meadow strips can be used as roadways for moving farm machinery when spraying and harvesting tobacco, thus greatly reducing soil compaction on the cultivated strips.

The other new conservation practice, the use of grasses for winter cover crops, is gradually being adopted by the tobacco farmers of Kentucky. Until recently the use of small grain and vetch as a cover crop on tobacco land was traditional.

Today field brome grass, an annual, and Kentucky 31 tall fescue, a perennial, are being widely used. Field brome grass was introduced into Kentucky by the SCS.

Both grasses produce from five to eight times as many roots in the 8-inch plow layer as wheat. They do not produce seed stems or head out as early as wheat. Plowing can be delayed 2 to 3 weeks without worry to the farmer or danger of the grasses getting woody or otherwise out of hand.

One farmer has been using fescue as a cover crop for several years with excellent success. He sows fescue at the last cultivation, a practice that was common with corn.

These discoveries have been dramatic lessons to Kentucky farmers that conservation practices diligently applied mean the difference between mediocre or poor farms and thriving, prosperous ones, whatever the crop. ♦

### **Tall Stubble and Standing Strips**

Think now of where the snow was blowing off the land last winter, and plan to leave tall stubble, standing strips of cornstalks, or unmowed sweetclover this crop season to help hold that moisture. ♦

## **Land and Water Conservation Fund Can Aid Local Recreation Plans**

**By Henry F. Nichol**

*USDA Representative on the Recreation Advisory Council Staff*

**T**HE Land and Water Conservation Fund Act, passed at the last session of Congress to provide more recreation opportunities on public land, will also have a significant effect on the private sector of American life. It is likely to be one of the most important conservation and recreation measures of our generation.

The act sets up a Land and Water Conservation Fund which will be used by States and Federal agencies to develop more outdoor recreation resources.

When President Johnson signed the act on September 3 he said that this bill "assures our growing population that we will begin to acquire on a pay-as-you-go basis the outdoor recreation lands that tomorrow's Americans will require."

### **Three Sources of Revenue**

The fund will obtain revenue from three sources: (1) Admission and user fees at Federal recreation areas; (2) revenues from Federal taxes on motorboat fuels; and (3) net proceeds from the sale of Federal surplus real property. In addition, the fund will include advance repayable appropriations by Congress which may average \$60 million annually for an 8-year period beginning in 1967.

Sixty percent of the fund will be made available as grants-in-aid to the States on a matching basis. Money to the States may be used for planning, acquisition, and development of recreation projects. Of the amount available to the States, two-fifths will be divided equally and three-fifths will be dis-

tributed according to need.

Although Congress has not prescribed a formula for determining need, it has indicated that three factors should be taken into consideration: (1) Population, (2) out-of-State visitor use, and (3) Federal resources and programs.

### **Districts Can Share**

Soil conservation districts, counties, and other political subdivisions of the State government may qualify for grants-in-aid under this program. Local requests for projects are submitted through the State government.

The other 40 percent of the fund will go to Federal agencies for the acquisition of certain types of land, including land needed for National parks and forests, and for the preservation of species of fish or wildlife that are threatened with extinction. Not more than 15 percent of the land acquired for National forests may be in the western half of the United States.

The act does not automatically provide financing for outdoor recreation. All money must be allocated through the regular budgetary process and must be appropriated by Congress.

Also the act does not provide any Federal acquisition authority. Areas may be acquired by Federal agencies only if authorized by Congress.

The act became effective January 1, 1965. The Bureau of Outdoor Recreation, which is responsible for its administration, estimates that \$45 million will accrue to the fund in the current fiscal year and \$125 million in fiscal 1966.



When in full operation, the fund is expected to reach \$180 million to \$200 million.

As already indicated, the act applies only to public land and land to be acquired for public ownership and use. It does not provide any direct assistance to private landowners.

The Land and Water Conservation Fund Act, however, will have important effects on Department of Agriculture programs and Rural Areas Development. One of the most important effects will be its impact on private recreation enterprises.

It is difficult to predict just what this impact will be. With more than \$100 million a year going into the States on a matching basis, there is some feeling that the recreation areas and facilities developed through this fund may reduce the opportunities for the private operator. Surely, it is important that fees for use of Federal recreation areas be set at rates that will enable private enterprises to compete on an equitable basis.

Estimates indicate that the fund will not begin to take care of the expected future demand for recreation facilities. If the fund is used in the right way, there would seem to be little doubt that the opportunities for the private sector will be increased rather than diminished.

### Comprehensive Plans

In order to qualify for funds, a State must submit a comprehensive statewide outdoor recreation plan. This plan will include all outdoor recreation resources and programs—Federal, State, local, and private—in the State. It will cover an action program extending over 5 years.

Money is available from the fund to assist States in making their comprehensive plans. Funds may also be made available for planning by the Housing and Home Finance Agency under Section 701 of the Housing Act of 1954.

The great potential of private land for recreation should be stressed throughout the preparation of State plans. All of the Department's programs on outdoor recreation should be considered in the State planning process. Each plan should be as complete as possible and should contain a proper balance between public and private recreation.

It is important that preparation of a State plan include consultation with all Federal and State USDA officials concerned, with RAD Committees and Technical Action Panels, soil conservation district officials, and other agricultural committees.

Secretary Freeman has recently focused attention on the need for developing the "nonfarm rural economy." He has pointed out that the traditional farming operations can provide a decent income for only 1 out of 8 or 10 of the families now living in rural America, and that nonfarm opportunities must be developed for the other 7 to 9 families.

Outdoor recreation on private rural lands may be one of the most important of these opportunities. The successful combination of private enterprise and the public effort to meet the increasing demands for outdoor recreation offers a challenge of the first magnitude. ♦

## Range Surveys

*(Continued from p. 149)*

is necessary to make periodic adjustments in stocking rates to insure proper range use.

The table on page 149 shows the kind of information obtained from an analysis of the vegetation on a sandy range site in the Rolling Red Plains in Oklahoma.

### Conservationist's Conclusions

With the foregoing information at hand, the range conservationist can draw the following conclusions

and interpretations for the guidance of the ranch operator:

(1) The range is in good condition. While 70 percent of the present vegetation is the kind that is best for the site it is obvious that sand sagebrush and Havard's oak have increased and that brush control should be practiced.

(2) The 4,000 pounds of vegetation provides more than ample soil protection, but the oak and sagebrush have replaced part of the climax decreasers, reducing livestock forage and using part of the moisture supply to produce lower quality plants.

(3) The type of forage is suitable for cattle, sheep, goats, deer, buffalo, and antelope. However, the sandy site is too subject to erosion to be used safely by sheep and goats. Fair and poor condition ranges on this site are not satisfactory grazing areas for cattle or big game. The young oak leaves often are poisonous to cattle.

(4) Ranges on this site in good and excellent condition provide favorable amounts of food and cover for quail and prairie chicken. Kangaroo rats and pocket gophers increase as range condition declines.

(5) When this range site adjoins bodies of water with recreation facilities, it is suitable for riding trails. It can also provide good hunting.

This modern, scientific survey gives the district cooperators sound information that he can use in developing a basic conservation plan, Mr. Allred concludes. The identification of the different range sites on the land and the classification of the vegetation on each site furnish a basis for making decisions on grazing management for livestock and game, the season of use, the wildlife and recreation opportunities, the kind and amount of conservation cover present, and the kind of treatment and management needed to improve the soil, water, plant, and animal resources for sustained production and income. ♦



# A Conservation Plan for County Roadsides

A CONSERVATION plan for the entire network of roads in Fulton County, Ga., is the goal of the county officials and supervisors of the Atlanta Soil and Water Conservation District.

The county commissioners are stabilizing backslopes on roadbanks as soon as possible after construction. When not busy on new roads, they are working to get vegetation on older roadbanks.

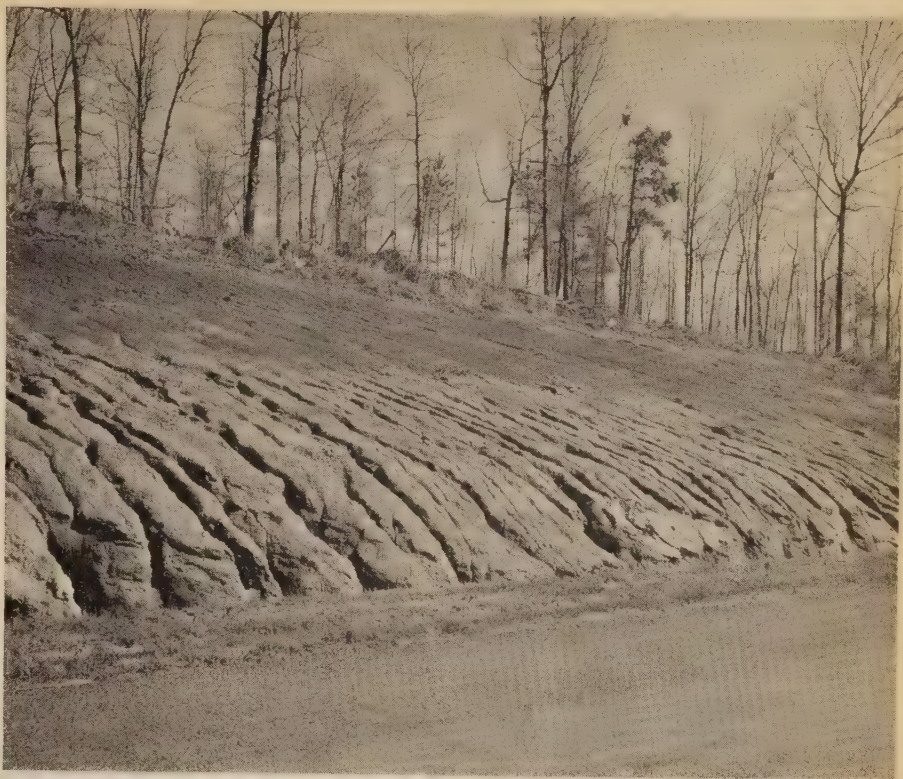
The work is being done under cooperative agreement with the conservation district and with the assistance of the Soil Conservation Service.

The commissioners became interested in vegetating backslopes when work started in Little River sub-watershed of the Coosa River in the northern part of the county. They entered into an agreement with SCS under which the county furnishes labor and SCS furnishes materials (lime, seed, and fertilizer) for establishing vegetation on the roadbanks. To date, roadbanks of all paved roads inside the watershed, a total of about 73 miles, have been vegetated.

The commissioners were so impressed with this work that they agreed to furnish all materials and labor and reimburse the Service up to \$3,000 a year for a conservation technician to supervise the same kind of work outside the watershed project. To date, about 24 miles of roadbanks have been vegetated outside the watershed.

A mixture of sericea lespedeza and weeping lovegrass or common bermudagrass is being used on the banks. Seed-bearing sericea hay is used for mulch and seed. Cooperators of the conservation district donate the sericea hay. The county cuts, bales, and stockpiles the seed-bearing mulch to be used during the winter and spring.

Five cooperators received permission from the Agricultural Stabilization and Conservation Serv-



A protective covering of weeping lovegrass hides the scars of erosion on a roadbank 3 months after planting.

ice to donate mulch from land that is in the Conservation Reserve —

GEORGE R. PEEPLES, *Area Conservationist, SCS, Decatur, Ga.* ♦





## Nolen J. Fuqua

Oklahoma

# Life of Public Service

**N**OLEN Jones Fuqua of Duncan, Okla., for 4 years president of the National Association of Soil and Water Conservation Districts and 1964 Watershed Man of the Year, came by his life of public service naturally.

His father, Frank Fuqua, built the first cotton gin and a hotel that helped get Duncan started and was elected the town's first mayor from 1900 to 1904. As one of the town's leading citizens, he was instrumental in putting in the first reservoir, an electric system, and good roads.

### Father and Son

One might say the father got the town started and his son helped to keep it going.

It was 10 years ago when floods and water shortages threatened the town with extinction that Nolen Fuqua led the campaign that assured the watershed protection and flood prevention project that brought prosperity back to Duncan.

Mr. Fuqua's influence reaches far beyond the limits of Duncan. He has traveled far and wide preaching the gospel of conservation and flood prevention.

But he still considers himself a Duncan "home town boy." He has lived most of his 70 years there. He was raised in a house just four blocks from the location of his office in downtown Duncan.

After graduating from the University of Oklahoma in 1919, he returned to Duncan where he went into the wholesale and retail gasoline business and into transportation. About this time he began farming around Duncan.

He first became interested in con-

servation during the early 1930's when the Nation was experiencing its worst depression and western Oklahoma farmers were facing the blight of the "Dust Bowl."

Then, about the only group combating wind and water erosion was the Civilian Conservation Corps. The CCC worked on the Fuqua farm, putting in a windbreak, some stock-water ponds, and terraces, among other things.

According to Fuqua, the work did wonders for his land, and from that day forward, he became a salesman for conservation.

So, in 1938, when Allen Kellogg, a former county agent and head of the local CCC, set out to organize a soil conservation district, the first man he approached was Fuqua. Their district was one of the first in the Nation.

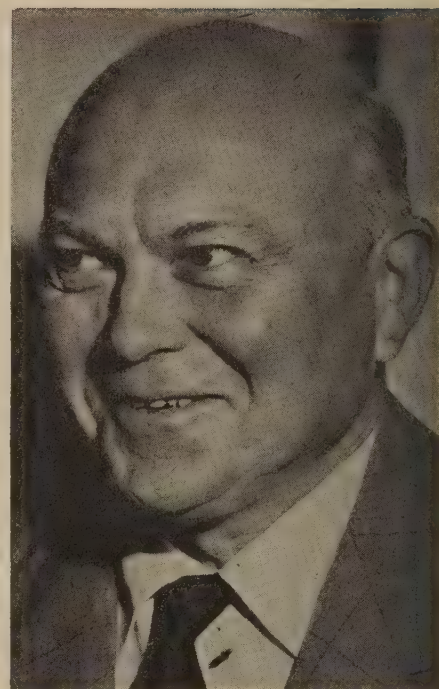
That same year, Fuqua was among a group of early district supervisors who organized the Oklahoma Association of Soil Conservation Districts. He was elected its first president and served for 9 years.

### National Organization

A year or so later, he was among another group from Texas, Oklahoma, Arkansas, and Louisiana that formed the National Affiliate of Soil Conservation Districts. Fuqua was elected vice president.

This was just before World War II. The organization was forgotten during the war as the Nation turned its attention to other things.

In 1947, district supervisors from throughout the country met in Chicago and formed the National Association of Soil Conservation Districts. Mr. Fuqua became a reg-



Nolen J. Fuqua

ional director in the national organization in 1950. He was named area vice president in 1951, national vice president in 1953, and was elected president in 1955. He served on many committees of the national organization.

In early 1962, he became executive director of the Soil and Water Conservation Districts Foundation, an organization created to sponsor libraries, bulletins, publications, and other things promoting conservation.

### Full-Time Public Service

Mr. Fuqua retired from his business in 1945 to devote full time to public affairs. He was elected mayor of Duncan in 1964. He is currently on the regional executive committee of the Boy Scouts of



America and serves on three national committees: Soil and Water Conservation, Rural Scouts, and Relations.

He is also on the Department of Agriculture's Rural Areas Development Committee. He is on the Board of Governors of the Agriculture Hall of Fame; a director of the Oklahoma Medical Research Foundation; regional director of the Kiwanas Farm-City Week, and has many other "dollar a year" positions.

He has received the Silver Antelope and Silver Beaver Awards for his work with Boy Scouts. He was elected to the Oklahoma Medical Sciences Hall of Fame.

One of his biggest honors came recently when the largest lake in the Upper Wildhorse watershed was named Lake Fuqua. The lake is being developed for extensive recreational uses, including a multimillion dollar Girl Scout camping area.

Mr. Fuqua, however, is more pleased with what the lake represents—the successful completion of the watershed project.

He claims his greatest reward for a life of public service is in seeing Duncan prosperous and growing, with plenty of water.

In 1959, as retiring president of the National Association of Soil Conservation Districts, Mr. Fuqua was presented a scrapbook in tribute to his many years of service to conservation. The first paragraph of the letter of dedication read:

"The National Association of Soil Conservation Districts can count itself lucky that you have a pioneer heritage, a love for the land, and an all-too-painful personal memory of the Dust Bowl days. Otherwise, your energy and ability might have been channeled in different directions. As things have turned out, you have devoted years of missionary zeal to halt the senseless misuse of soil and water resources." ♦

# Preservation of Natural Beauty

**By Gladwin E. Young**  
*Associate Administrator*

**T**HE beauty of America and the bounty of America go hand in hand. We need not lose one to gain the other.

A countryside of neat farm homes, red barns, rolling fields of grass, a quiltwork of cropland, tree covered hills and streambanks—all this we have come to know as "America the Beautiful." This is indeed the natural splendor of America.

This is the landscape that produces our clear streams and steady water supply. This is the land that produces so abundantly our food, our clothing, and our shelter that make beauty a meaningful human experience.

But just as beauty and bounty go hand in hand, so do ugliness and poverty.

Duststorms arise from land made barren of its vegetation. Floods begin with water racing down the slopes of tired and wornout fields to join the torrents from denuded forests and to spread ruin over the fertile valleys.

Poverty begets ugliness and ugliness begets poverty.

The Nation's efforts to assure successful family farms and healthy rural communities are integral parts of the war on poverty and a crusade for a beautiful America.

For those who can make longer journeys across the country, there are opportunities to enjoy the diversity of scenery of the great desert areas, the National Forests and Parks. And for a relatively few people the wilderness areas offer a peculiar kind of beauty. These also are a part of the beauty of America that must be preserved.

But America is beautiful because of what man has done. It could not be beautiful to 190 million people if it were still an "untouched

and unspoiled wilderness." It can be made more beautiful by removing the ugly spots caused by man's careless and thoughtless actions.

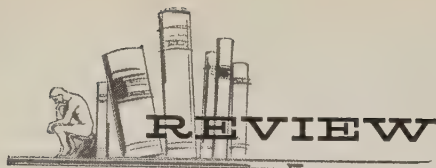
Most of the land in the United States—three-fourths of it—is privately owned or operated. Most of these people have pride in the appearance of their properties. But a job still remains to bring about needed erosion control, fire control on forests and woodlands, flood control, reforestation, adequate rural housing, planned urban development, road and highway beautification, elimination of automobile graveyards, and correction of other blemishes on the landscape.

Decisions about the use and management of most of the Nation's landscape are made by millions of land owners and operators—not by public agencies. This means that the public can express its interest in how the landscape is used only as it finds ways to cooperate with these millions of owners. Fortunately, much experience has already been gained about ways to do this.

A nationwide crusade for developing a deeper appreciation of America's natural beauty would be relatively meaningless if it did not place first and foremost emphasis on the splendor and beauty that already exist, and that can be further enhanced, on the productive farmlands, woodlands, and grazing lands across the Nation. The beauty of the deserts, the mountains, the wilderness, and the swamps and marshes are a part of the total beauty of the country because they stand in contrast to the bountiful lands on which life itself depends.

We need not give up one for the other. We have both. We need to keep them in proper perspective as we seek to find ways to enhance these great values. ♦





**Man and Land in the United States.** BY MARION CLAWSON. 1964. *University of Nebraska Press, Lincoln.* 178 pp., maps and charts. \$4.50.

This might be called the little book that goes a long way. It begins far back in English history to explain why land ownership has been and still is a powerful force in forming our "American way."

Along the way it tells, in summary but interestingly, as complete a story of our forefathers' and our own generation's land tenure and use as could possibly be included in so small a book.

An interesting feature of the book, showing the author's interests in the land of our hemisphere as a whole, is a chapter on development of land tenures and uses in Latin America and the resulting situation today in contrast to that of the United States.

The latter half deals brilliantly although summarily with our land management and tenure problems today and in the foreseeable future. Agricultural land, and the demands of the public upon it, are shown to be our greatest problem, and crucial in decades just around the corner.

It takes only a short time to read this book, but one does a considerable amount of cogitating once it is finished. It should find a permanent spot in both junior and senior high schools. And, it has real readability for any one. — PHOEBE HARRISON.

**North Carolina Lands.** BY KENNETH B. POMEROY AND JAMES G. YOHIO. 1964. *American Forestry Association, Washington, D. C.* 372 pp., illus. \$6.00.

In 1956, the American Forestry Association initiated studies of ownership, use, and management of forest and related lands in three

distinctly different regions.

"North Carolina Lands" is the report of the third and last study. By making it in a State where small, private, nonindustrial properties predominate, the full range of Federal, State, and private ownership of the Nation's woodlands was sampled.

These studies were designed to point the way to similar studies that should be made in each of the other States as an aid to programming developments for future economic welfare.

They were also designed to create an appreciation of the role of trees, water, soil, recreation, and wildlife in the total life of the Nation.

The chapter headings indicate the exhaustive nature of this study: Resources and Industries; Evolution of Ownership; State, County, and Municipal Agencies; Federal Departments and Agencies; Private Lands and Recommendations.

Each topic appears to have been most thoroughly studied—with one exception. Soil conservation districts are not listed as a local agency nor is their potential for the development of resource conservation programs appraised. Such an omission by those who are considering current land use programs in North Carolina would be tragic.

This omission in the present report, however, does not keep it from being on the "must read" list for all people who have an interest in resource conservation in North Carolina.—T. B. PLAIR, *Woodland Conservationist, SCS.*

#### **Wildlife on the Public Lands.**

BY THE BUREAU OF LAND MANAGEMENT. 1964. *U. S. Dept. of Interior.* Unnumbered, unpagcd, illus.

Profusely illustrated and printed in full color throughout, this attractive brochure tells the story of wildlife against the background of its environment on the land administered by the Bureau of Land Management

The booklet describes the major ecological formations represented

on the public land: Desert, Grassland, Coniferous Forest, and Tundra. There is an introductory explanation of some of the principal concepts of ecology and a concluding statement of principles of wildlife conservation.

The result is an effective introduction to ecology that should appeal to the general reader and lead to a better understanding of conservation problems on all land, not just that administered by BLM. ♦

#### **New Publications**

**Developing the Self-Guiding Trail in the National Forests.** 1964 *U. S. Dept. Agr. Misc. Pub.* 968. 18 pp., illus. Instructions applicable also to hiking trails on private recreation developments.

**Evaluation of Bermudagrass Varieties for General-Purpose Turf.** BY F. V. JUSKA AND A. A. HANSON. 1964. *U. S. Dept. Agr. Agr. Hdbk.* 270. 54 pp., illus.

**Defense Against Radioactive Fallout on the Farm.** 1964. *U. S. Dept. Agr. Farmers Bul.* 2107. 24 pp., illus. Protecting people, livestock, land, and crops; emergency defense services.

**Accelerating Rural Outdoor Recreation on Public and Private Lands.** 1964. *U. S. Dept. of Agr.* Unnumbered, unpagcd. An illustrated brochure with maps showing where USDA aid has helped increase recreation facilities.

**Replenishing Underground Water Supplies on the Farm.** BY DEAN MUCKEL. 1964. *U. S. Dept. Agr. Leaflet* 452. Do's and don'ts on selecting the recharge site and methods to use.

**Common Trees of Puerto Rico and the Virgin Islands.** BY ELBERT L. LITTLE, JR., AND FRANK H. WADSWORTH. 1964. *U. S. Dept. Agr. Hdbk.* 249. 548 pp., illus. \$4.25 (cloth). Every species illustrated by a full-page drawing. ♦

#### **The Record Shows**

The record through 7,000 years shows that great empires, such as Mesopotamia, Babylonia, Syria, Phoenicia, and other great Nations in the past and present, can trace their downfall or decline to improper use of the land. Some of this information is summarized in "Conquest of the Land Through 7,000 Years" (*USDA Agr. Inf. Bul.* 99). ♦



From the Administrator:

## *Range Conservation • New Zealand Lessons*

**R**ANGE CONSERVATION has much to offer in the general adjustment of agricultural production to meet the needs of modern America.

The widespread practice of conservative grazing on native range-lands provides greater stability to ranch operation while it strengthens soil and grass resources for future needs.

Proper use is the basic practice of range conservation. Reseeding, brush control, and other range-improvement measures are insufficient unless accompanied by proper grazing; in many situations, proper grazing alone will get the desired results.

Our growing fund of cost-return information shows that proper use is also the basic requirement of profitable ranch operation. At the same time, it usually results in no more, and often smaller, per-acre yields of animal products than does heavy grazing. And quality of meat, hides, and wool are improved when the animals have an ample supply of forage on moderately or lightly grazed range.

In other words, proper grazing often produces less, but higher quality, animal gain, and puts more net profit in the producer's pocket.

The shift from cropland to grass as a land use is recognized as a basic strategy in reducing crop surpluses and conserving soil. The potential for profitable grazing of native grasses needs to be better recognized in many sections of the country.

Outside the southeastern pine areas, there has been little attention to range (native grass) management east of the Mississippi.

But recent observations by SCS conservationists indicate that profitable enterprises can be based on native grazing land in every State.

The Soil Conservation Service intends to push hard to develop the art of native grass management for all sections of the country.

**N**EW ZEALAND provides some important lessons for people throughout the world who are interested in resource conservation and long-term economic growth.

I had the unique privilege last fall of seeing firsthand the soil and water conservation problems, programs, and organizations of that country as a consultant to its government. I was there by invitation to make suggestions on how the administration of its expanding conservation program could be improved.

I made my recommendations in an atmosphere of cordial frankness that characterizes any meeting of sincere professionals concerned with the long-term welfare of people and resources. I hope my suggestions will prove helpful to the authorities of New Zealand. I know that I profited from the experience.

I found New Zealand faced by many of the same conservation problems that are familiar in this country. Its successes and failures further confirm many of the principles we have learned in our own experience.

For one thing, I learned anew the lesson of the unity of watersheds and the need for coordinated action on upstream and downstream problems.

One of the major difficulties in New Zealand arises from the fact that most of the really good land is in the valleys, where it is subject to damage from floods and detritus from the hills; and that responsibility for the downstream "river works" is lodged in one agency that frequently shows little concern for soil erosion control, while another authority works in the hill lands with no direct concern for the valleys.

Obviously, a primary need is for consolidation or coordination of efforts to produce comprehensive coordinated plans of action for entire watersheds. Conservative use and management of the high grazing lands and forests are essential to the continued productivity of valley farms, so essential to the nation's economy, just as in our own mountain West.

In a similar way, New Zealand's experience, like ours, proves again the need for (1) developing a conservation consciousness among both citizens and government officials, (2) having the responsibility for soil and water conservation focused in a national agency that devotes its major effort to this program, and (3) lodging responsibility for doing work on the land in a local agency with maximum autonomy consistent with general public interest.

As a guiding principle I suggested that: "the concept of 'use without abuse' be a cornerstone of conservation policy and that public support be not considered as a 'subsidy' but as sharing of responsibility."

—D. A. WILLIAMS.



If your address changes, please notify us of your complete new address, including Zip Code number, and include old address with our code number as shown above.

## More and Better Grass Pays in Great Plains

**D**OES it pay to reseed submarginal cropland to grass?

George W. Wingfield of Idalia, Colo., thinks so. He has 588 acres of proof.

Mr. Wingfield is a Hale Soil Conservation District cooperator and a member of the district's board of supervisors.

When he bought the 3,360-acre sandhill ranch, the cropland was subject to wind erosion, some of it severe. Blown-out areas were as deep as 15 feet, some of them down to the shale.

Under his conservation plan in the Great Plains Conservation Program, Mr. Wingfield planted sorghum on the areas most subject to erosion and left the stubble to give protection to grass seedlings. He planted a mixture of native species: Switchgrass, sideoats grama, blue grama, sand lovegrass, and big and little bluestem.

He also provided for stock water and cross-fencing to make possible better management of his grass resources. The sand sagebrush was controlled by spraying. Pastures have since made rapid recovery.

In spite of last year's drought, the fields seeded to grass provided dependable grazing, bringing new stability to the Wingfield enterprise. The returns from grass have been better and more reliable than the year-by-year yields from the

land through cropping. And grassland is valued for tax purposes at about a third of the rate for cropland, he points out—GEORGE E.

BAILEY AND CARL S. FONTE, *Work Unit Conservationist, and Range Conservationist, SCS, Wray and Sterling, Colo.* ♦



Native grasses made rapid recovery after the sand sagebrush was killed by spraying to the right of the fence on the George W. Wingfield ranch. The pasture to the left has not been treated.



35

# Soil Conservation

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

MARCH 1965  
VOL. XXX NO. 8

MAR 9 1965

CURRENT SERIAL RECORDS



## A PLACE FOR WILDLIFE:

*Northwestern Watershed*—Page 171

*Nature Trail*—Page 177

*Eastern Shore*—Page 179

*Southern Ricelands*—Page 173

## APPEAL TO YOUTH:

*Outdoor Laboratories*—Pages 185, 187

*Conservation Camps*—Pages 175, 189



# Soil Conservation

## Answers . . .

It's the policy of SCS to staff with whatever kind of technical specialists are needed to give the best answers to resource problems in each area of activity. So it was that we employed a fish management biologist to find ways to provide for anadromous fish in the small watershed projects of the Pacific Northwest. Biologist Dean Marriage reports (p. 171) on early successes there in cooperation with game and fish agencies. Similar joint action is being sought on wildlife problems peculiar to other sections of the country.

**Trend:** Increasing attention to resource education creates a demand for places where teachers and pupils can study living things in natural outdoor settings. More and more schools are meeting this need by providing outdoor laboratories on their own grounds. A trend toward larger building sites is reported (p. 187) by the American Association of School Administrators, and reflected in increasing requests to SCS for assistance in planning them. Conservation camps (p. 175 and 189) and other activities aid in instructing young people in resource needs and care.

**Cover:** A fawn against a background of grass in the Upper Nueces-Frio Soil Conservation District of Texas symbolizes the combination of wildlife and range conservation that is making game an important economic resource on the private rangeland of the Nation.



## CONTENTS

- 171 Hope for Salmon and Steelhead**  
Small watershed structures provide for migratory fish  
*by L. Dean Marriage*
- 173 Riceland Wildlife Habitat**  
Farmers feed waterfowl, grow fish and crawfish  
*By Carl H. Thomas*
- 175 Youth Conservation Camp**  
Boys learn about Arizona's resources  
*By Danny Freeman*
- 177 A Farmer's Nature Trail**  
New York Conservationist attracts wildlife and people  
*By Frank Leavitt*
- 178 Pheasant Hospitality Association Welcomes Hunters**  
*By Thomas J. Skillman*
- 179 Watershed Project Turns the Tide**  
At Hancock's Bridge
- 183 Landowners and Farmers Plant Shrubs for Wildlife**  
*By David N. Allan*
- 185 Moravia Students Learn Conservation on School Farm**
- 187 Larger School Properties Provide for Outdoor Laboratories**
- 188 Litterbugging**  
*By Mrs. Helen Guthrie*
- 189 SCS Role Under Economic Opportunity Act**
- 190 Review:**  
Wildlife Management and Conservation; Natural Resources for U.S. Growth; New Publications
- 191 From the Administrator**  
Farm Game; Conservation Districts; Wildlife for Everyone

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

Editor  
BEN O. OSBORN

Editorial Assistant  
GEORGIE A. KELLER

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Photos available on request.

**Commercial names:** Mention of commercial enterprises or brand names does not constitute endorsement by the Department of Agriculture.

**Subscriptions:** \$1.75 per year, \$2.50 foreign. Single copy, 15 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.

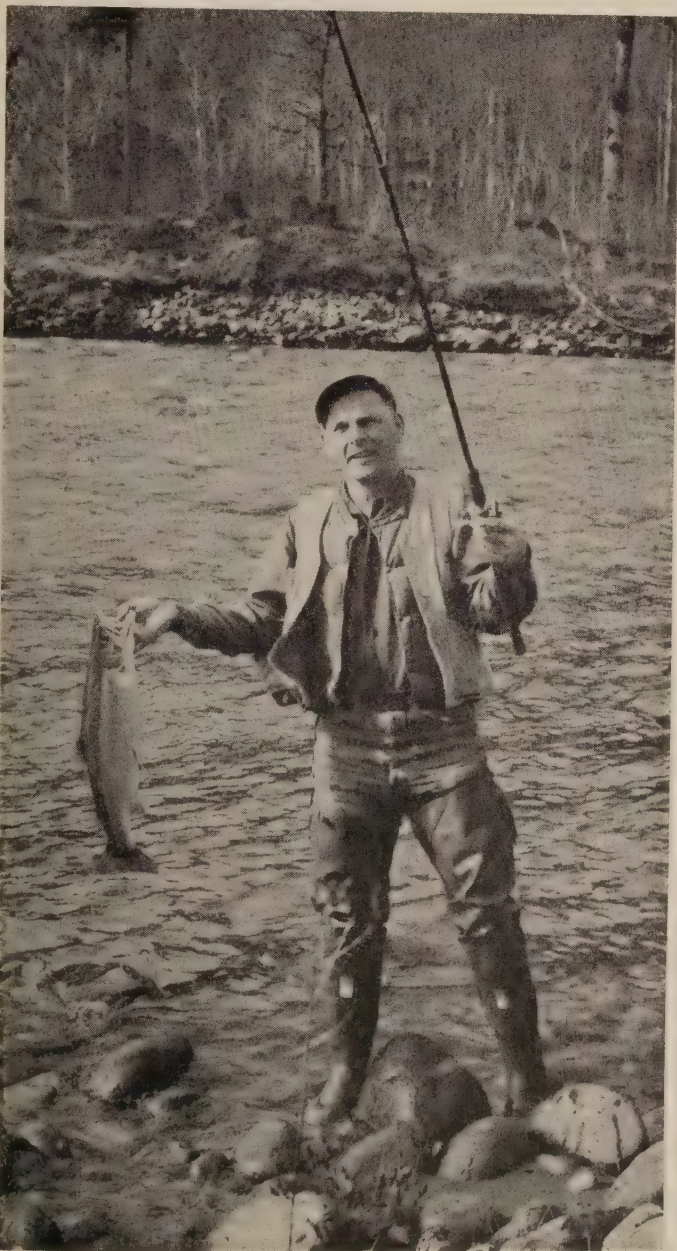


# Hope for Salmon and Steelhead

## Small watershed structures provide for passage of migratory fish

By L. Dean Marriage

*Fish Management Biologist, SCS Regional Technical Service Center, Portland, Oreg.*



**S**ALMON and steelhead trout—easily the most prized and profitable fish for both sport and commercial fishermen on the Pacific Coast—present challenging problems to the watershed planner.

Both species need both salt water and fresh water to complete a successful life cycle. This means they need unobstructed passage from stream to ocean and from ocean to stream.

Floodwater retarding structures and other dams on salmon and steelhead streams in the Northwest need special designs and extra facilities to insure the survival of these fish. The Soil Conservation Service, working with State and Federal fishery agencies, is helping local communities provide for fish habitat requirements in their watershed project plans.

It's not just a matter of sentiment—sport and commercial fishermen harvest hundreds of thousands of these anadromous (migratory) fish annually from both ocean and stream.

It is in the early planning stages of a watershed project that the fishery resources and factors limiting fish production need to be defined. Then, plans for resolving problems and exploiting opportunities can be devised to the satisfaction of fishery agencies and the local sponsors.

### Clean, Cool Water

Salmon and steelhead trout spawn in clean gravel beds of cool, fresh-water streams. Their progeny spend up to 2 years in fresh water after hatching, then migrate to the Pacific Ocean where they grow to adulthood in 1 to several years. Then they return to their parent streams to repeat the process.

The distance from the ocean to the spawning beds varies from a few to hundreds of miles, depending on the species of fish. Salmon die after spawning,

**Steelhead trout, favorite of northwestern sport fishermen, must have free passage from the sea to upstream spawning grounds to survive (photo courtesy of Oregon State Game Commission).**



but steelhead trout may return in subsequent years to spawn several times.

Because of the migratory habits of both adults and juveniles, routes to and from spawning and rearing areas within a watershed must be unobstructed if fish populations are to be perpetuated or increased. Structural measures in watershed projects need to be designed to accommodate the migratory fish.

### Examples of Planning

An example of such planning is the Skipanon River Watershed Project in Clatsop County near Warrenton, Oreg. Here a tidewater barrier was to be constructed to protect agricultural land from flooding. This could have spelled trouble for spawning salmon and steelhead trout. Through cooperative efforts of the watershed project sponsors, the State and Federal fish and game departments, and the SCS, a barn-door tide gate was designed and installed on one of the three barrel inlets in the barrier to allow adult silver salmon, sea-run cutthroat trout, and steelhead trout to pass through.

Farther up the Skipanon River, two more water-control structures were equipped with pool-type fish ladders to permit easy access to upstream spawning grounds.

In the Central Sonoma Water-

**The chinook salmon, mainstay of commercial fishermen, also is a migratory species (Photo courtesy of Fish Commission of Oregon.)**

**Adult steelhead trout going up Santa Rosa Creek pass under the City of Santa Rosa, Calif., through one of these 1,500-foot long, 14-foot square box culverts in the specially designed fishway on the right.**

**The 8x10-foot barn-door type gate on the right barrel of this flood-control structure in the Skipanon River Watershed Project permits migratory fish to reach upstream spawning ground.**





shed Project at Santa Rosa, Calif., proposed flood-control measures on Santa Rosa Creek presented several fishery challenges. Each was met by special provisions in the structural plans.

Adult steelhead trout now move safely upstream through a 1,500-foot fish passageway 4 feet wide and 3 feet deep contained in one of two 14-foot-square box culverts that carry Santa Rosa Creek under the city.

In the manmade channel below the fishway, boulders 3 to 5 feet in diameter were grouted into the bottom to give migrating fish natural resting areas where they could escape the high velocities of the stream.

### Other Measures

Farther upstream a six-pool vertical slot fishway was constructed at a complex diversion structure.

Other accommodations being considered for anadromous fish in Pacific Coast watershed projects include:

A minimum pool in an irrigation reservoir for rearing juvenile salmon and steelhead trout.

Low-flow weirs in a streambed to create more suitable habitat for fish during periods of low water.

Metered release of water from storage reservoirs to supplement low summer streamflow.

Screening juvenile fish from pumps and diversion canals.

Release of water from the lower levels of reservoirs to keep downstream water cool.

A fish passageway through the principal spillway of a flood control-irrigation reservoir.

Thus the challenge of perpetuating salmon and steelhead trout and developing fishery potentials is being met in small watershed projects in the Pacific Coast States. ♦

## Riceland Wildlife Habitat

*Farmers make feeding grounds for waterfowl, grow fish and crawfish in rotations*

By Carl H. Thomas

*Biologist, SCS, Alexandria, La.*

**R**ICELANDS of southwest Louisiana are a wildlife paradise. Following a crop of rice the land can be managed for ducks, geese, snipe, crawfish, or channel catfish.

A 1-year rice, 1-year fallow, or a 1-year rice, 2-year fallow rotation is the most common system.

Ricelands offer a variety of alternatives to the wildlife conserva-



Housewives pay 10 cents a pound for crawfish they harvest from a rice farmer's field in Acadia Parish Soil Conservation District, La.





A concentration of wild ducks, principally mallards, in midwinter testifies to the rich food supply provided by a Gulf Coast Soil Conservation District cooperators' ricefield after harvest.

tionist. Soil Conservation Service technicians assist the soil and water conservation districts of Louisiana's rice belt in helping landowners plan ahead for multiple use that benefits both the rice crop and the wildlife habitat.

### Diet of Rice

About 90 percent of the food chosen by mallard ducks feeding in three southwest Louisiana parishes consists of rice and seeds of plants associated with rice growing.

Alton Lyons of Jefferson Davis Parish, cooperating with the Gulf Coast Soil and Water Conservation District, manages his riceland for ducks. He puts from 1 to 12 inches of water on the rice stubble following harvest. The ducks feed on waste rice and weed seeds that amount to as much as 175 pounds an acre on his fields.

Fields that have been out of rice production for 1 year and allowed to grow native vegetation provide an average of 328 pounds of good duck food an acre. These fields, too, are flooded in the winter.

### Snipe Feeding Areas

Ricefields make excellent snipe feeding areas when properly prepared. The rice stubble is chopped or disked lightly following the rice harvest. The field then is saturated with water, but not flooded. This "wet" condition is maintained throughout the winter months, using the existing rice irrigation system. These ground conditions support growth of insect larvae, crustaceans, and earthworms—choice snipe foods. Over 100 snipe have been flushed from a 30-acre field managed in this manner.

Crawfish, a popular food in south Louisiana, are being produced on ricefields through management of water and vegetation. Up to 1,000 pounds of crawfish an acre have been harvested.

The red swamp crawfish occurs naturally on most southwest Louisiana ricefields. Roland Faulk, a rice farmer in the Acadia Soil and Water Conservation District, floods a portion of his fields following rice harvest to a depth of 6 to 18

inches. This depth of water is held over into the following spring. The baby crawfish, hatched in October, feed on the rice stubble and straw during the winter and respond with quick growth in early spring. Harvest of crawfish usually begins in late February or early March.

Richard Walker, a rice farmer in Allen Parish, hatched baby channel catfish in a farm hatchery and stocked 15,000 in one field and 20,000 in another last year. He is harvesting the fish this winter. ♦

### Soil Classification Wins Award for Smith

The new soil classification that SCS began using January 1 earned the 1964 Soil Science Achievement Award of the American Society of Agronomy for its principal author, Dr. Guy D. Smith, director of the Soil Survey Investigations Division.

The system was described in an article in the December issue of *Soil Conservation*. ♦



# Youth Conservation Camp

**Boys learn about Arizona's resources  
and have the time of their lives**

**By Danny Freeman**

*Area Conservationist, SCS, Prescott, Ariz.*

**E**ACH year about 50 boys from throughout Arizona are picked for what is to many of them a highlight of their young lives: A week at the annual Youth Conservation Camp.

Sponsors of the camp are the Arizona Agricultural Extension Service, the Soil Conservation Division of the State Land Department, and the Arizona Association of Soil Conservation Districts.

Their objective is to arouse normal curiosity of youth and develop appreciation and understanding of Arizona's natural resources. Boys are shown what is being done to conserve soil, water, ranges, watersheds, forests, wildlife, and historical sites in the State.

The camp's location is shifted each year. The first year, 1962, it was at beautiful Point of Pines, a

remote spot northeast of Globe on the big San Carlos Apache Indian Reservation. The following year, camp was at the Boy Scout R-Bar-C Ranch in the dense ponderosa pine area of the Tonto National Forest east of Payson.

## Camp Moves Around

In 1964 activities were at another Boy Scout camp near Safford, Snow Flat, which is up 8,000 feet near the top of Mount Graham in Coronado National Forest.

Location of the camp determines how activities will be conducted, particularly in the planning of nature hikes and field trips. For example, Point of Pines is near a group of old Indian ruins. It serves as an outdoor classroom in archaeology. Dr. Emil Haury of the University of Arizona, a noted

anthropologist, reviewed the findings of scientists and showed campers items they otherwise would have missed in the ruins.

## Boys Become Friends

The camp is open to Arizona boys from 15 to 21 years old—regardless of race, color, or creed. Living, working, playing, and learning together create close friendships among the boys, although most are strangers when they arrive at camp. A case in point: Indian and white boys quickly become friends—an interesting development when you consider that many of the Indian ancestors were at war with Arizona settlers only three generations ago.

Intermingling of youths from all parts of the State promotes exchange of ideas, experiences, and new knowledge about the communities represented.

Barry N. Freeman, University of Arizona Extension Watershed specialist who directs the camp, is credited with much of its success. The boys like and respect him because discipline is firm but fair. No "horsing around" or "goofing off" allowed!

Instructors are specialists in various fields of conservation who know how to teach young people. They represent the Soil Conserva-

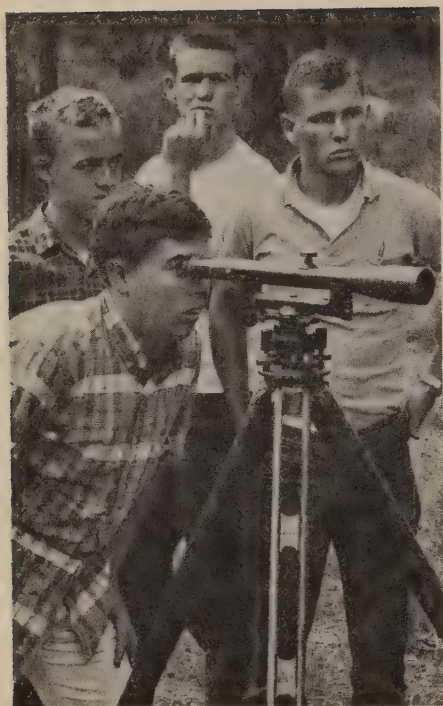
Phil Young of the SCS explains to a group of boys how soil texture differs in different soils.



Type of terrain and cover make a difference in the water that runs off, Young explains.







Four boys learn how to use an engineering level at the Arizona camp.

tion Service, Forest Service, Fish and Wildlife Service, Bureau of Land Management, Bureau of Indian Affairs, University of Arizona, Arizona Game and Fish Department, the State Land Department, and some private organizations, plus industry, farming, ranching, and other vocations.

### What They Learn

Principal subjects covered are water, soil, timber, wildlife, range, and recreation. Water—considered the most precious of Arizona's resources—is pictured as the limiting factor in growth and progress of Arizona. The boys are taught how management of watersheds and use of water affect growth and well-being of the State.

The boys learn what proper range management is and how to identify plants. They learn why it is necessary in arid Arizona to protect and conserve forage plants so they can multiply and flourish to provide feed for livestock, game animals, and wild birds.

Soil is given high priority at the camp. Phil Young, SCS technician from Tucson, has been at all three

camps. With help of test tube and sod, he gets his message across graphically: Ground cover reduces runoff and erosion and increases water going into the ground for plant use and replenishment of underground water.

Timber resources are covered in the camp curriculum, too: Planting, thinning, pruning, and logging are observed in the forest.

Recreation is shown as an activity that fits nicely with timber. Where trees are found, scenery is usually pleasant and the recreation seeker finds beautiful surroundings when he goes hiking, horseback riding, camping, picnicking, or swimming.

Along with these practical aspects of conservation, the boys learn esthetic values and wholesome living.

### Scholarships Help

Scholarships and contributions from the State Soil Conservation District Association (\$500 a year) and local conservation districts pay for everything except the time and expense of the instructors. The latter costs are borne by the instructors' employers.

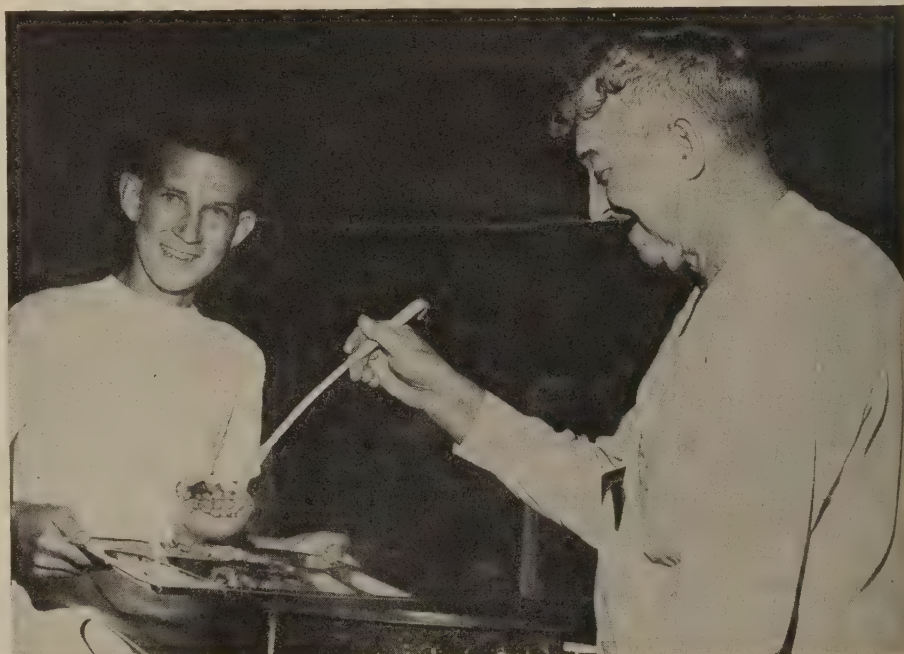
Scholarships of \$25 each are fur-

nished from an ever-growing list of backers: Individual conservation districts, service clubs, banks, livestock organizations, 4-H leader associations, FFA chapters, Arizona chapter of the Soil Conservation Society of America, Arizona section of the American Society of Range Management, and several Indian tribal councils.

T. L. Meredith, president of the Arizona Association of Soil Conservation Districts, thinks sponsoring the Arizona Youth Conservation Camp is one of the most important activities of the association. "We want to expand it to reach more boys and in the near future set up separate camps for girls. We think we have something real good going and we want to see it grow."

What do the campers themselves think? Boys attending react pretty much the same—they praise the experience and talk of it for weeks to their parents and friends. A typical way of putting it: "I learned more in that 1 week than I did during all last school year."

An exaggeration perhaps—but it points up that the camps are "something special" to Arizona boys. ♦



Serving up the evening meal to a hungry group is nothing new to camp cook Glen Ellison, a long-time cowboy chuck wrangler.



# A Farmer's Nature Trail

*New York conservationist attracts wildlife  
and invites people to enjoy it*

By Frank Leavitt

*Work Unit Conservationist, SCS Delmar, N.Y.*

**M**ORE than 3,000 people have walked the nature trail that is open to the public on the farm of New York Farmer-Conservationist Burton Belknap.

The trail starts on the dike of a pond and meanders up a hill through a plantation of larch, scotch pine, and spruce, and into a wooded area of mixed hardwoods and hemlock. It cuts through a lime rock crag, and back to the pond. Painted arrows mark the trail and signs point out the different kinds of trees, shrubs, flowers, bird nesting places, and animal habitats along the way. Commissioner Harold Wilm of the New York State Conservation Department cut a grapevine to officially open the trail in the summer of 1959.

## Rod and Gun Club Helps

The nature trail is a joint effort of Mr. Belknap and the Turnpike Rod and Gun Club of Westmere which is established on the 153-acre farm, located about 9 miles from Albany.

Mr. Belknap is a former assistant supervisor of rural education with the New York State Board of Education and is the author of several books.

Since moving to his farm in 1937, Belknap has campaigned for wildlife protection and a greater appreciation of nature. At first, he posted his property with "No Hunting" signs, then established rules for hunters who asked permission to use his property. Eventually, the "No Hunting" signs

were removed and posters marked "Safety Zone" were placed around the farm buildings.

In 1949, Belknap became a cooperator with the Albany County Soil Conservation District. The following year, in cooperation with the district and the New York State Conservation Department, he planted 10,000 trees. The next year he planted 10,000 more trees.

## Plantings for Wildlife

In some areas of the farm, natural reforestation of white pine has taken place. About 80 acres of once open land has grown to

clumps of maple, dogwood, and other native shrubs. Club members have planted open areas with strips of corn and buckwheat to supply food for game birds. And, they have planted shrubs for wildlife use in cooperation with the Soil Conservation Service.

In the fall of 1949, Belknap received SCS technical assistance in building a small pond. At this pond the nature trail begins. Along the edge of the pond he planted a hedge of multiflora rose supplied by the soil conservation district in cooperation with the New York State Fish and Game Department. Numerous birds nest there.

When, in the mid-1950's the Turnpike Rod and Gun Club arranged to lease Belknap's property, the objective was to promote public interest in nature and good sportsmanship among hunters. That objective has been realized. Only Mr. Belknap's "Safety Zone" signs remain to caution hunters.

The club has a junior membership for boys and a strong program of family activities. ♦



Commissioner Harold Wilm of the New York State Conservation Department cuts a grapevine to officially open the nature trail of the Turnpike Rod and Gun Club. Farm Owner Burton Belknap is second from left, wearing the cap.



# Pheasant Hospitality Association Welcomes Hunters to Plains

By Thomas J. Skillman

Wor. Unit Conservationist, SCS, Yuma, Colo.

**T**AKING in visiting hunters for room and board was a new—and some thought crazy—idea to the farmers of the Yuma, Colo., area a couple of years ago. Now it's a going enterprise of the Yuma Pheasant Hospitality Association under the sponsorship of the Yuma Soil Conservation District.

Seven farm families were in the program the first year of its operation in 1963. They kept 36 hunters during the season and grossed approximately \$63 per farm family.

The association grew in 1964 to 20 families which kept 125 hunters and grossed approximately \$69 per family. Participation is expected to double in 1965.

The hunters came mostly from the Denver, Boulder, and Colorado Springs areas. Assistance from radio, TV, newspapers, and the

Colorado Game, Fish, and Parks Department was helpful in getting the word out to the sportsmen.

There were many reasons for an association of this kind to get started: (1) There was a need for better understanding between landowners and sportsmen, which it was hoped the association could develop; (2) landowners needed encouragement to develop better pheasant habitat, which would increase pheasants and improve hunting; (3) landowners needed an additional source of income; and (4) increasing numbers of hunters coming to eastern Colorado each year were taxing the facilities of local motels, hotels, and cafes.

The sponsorship of the Yuma District enables the infant association to get enough financial backing to operate. A 5-member board



Home-cooked food rivals the hunting as an attraction for the city sportsmen and their families.

of directors, appointed by the supervisors of the soil conservation district, makes plans and directs the association.

The Colorado Game, Fish and Parks Department provided more than 35,000 trees through the conservation district for planting in windbreaks and wildlife areas.

The participating families had nothing but praise for the visiting hunters and all say they plan to continue the operation. The hunters were highly satisfied and some plan to bring their families back another time.

One Boulder, Colo., man said: "I firmly believe in your type of operation. Let's give a fair share of the pheasant crop where it belongs—to the private landowners. In addition, my son and I are intrigued with the idea of staying out on the farm. I wish you best of luck with your venture."

An outgrowth of the Yuma Pheasant Hospitality Association could be a full-scale vacation farm enterprise for this plains county. Some families are thinking about it right now. ♦



Bob Bruggeman (l.) welcomes the returning hunters on his farm: Young Oishi (shaking hands), Samuel Miller, Dr. Y. Oishi, and Jerry D. Punkett.



## At Hancock's Bridge . . .

# Watershed Project Turns the Tide

*Town and farm leaders work together to protect historic New Jersey community*

**I**NCREASED wildlife harvests and revived truck farming have replaced flooded fields around Hancock's Bridge, N. J.

To landowners in this newly protected 5,590-acre watershed, the change means final victory over a 150-year flood hazard and the return of prosperous country living to their historic Salem County community.

Gale-driven Delaware Bay tides had buffeted the community since early pioneers first settled the area. Tides were diked out of fertile farmland and muskrat trapping marshes. But in passing decades, the hand-built seawalls were topped or breached annually by powerful coastal storms. Constant repairs drained the villagers' finances.

In 1955 a hurricane dealt the

community a near-fatal blow when waves blasted a 90-foot breach in the dike. Five months later, in the midst of a \$16,000 dike-repair job, a second storm smashed the new dike. It left a gaping hole in their seawall and no money for repairs. Crop fields and pastures became briny fisheries. Homes and roads were swamped by high tides. Muskrats abandoned their flooded habitat for more stable marshy feeding areas. The entire community floundered in an economic doldrum while brackish floods covered its valuable land with each tide change.

### A Dramatic Change

The dramatic change from this devastation to a thriving economy started in 1957 when the Salem-

Cumberland Soil Conservation District and two local farm organizations—Thorofare and Locust Island Meadow companies—sought technical and cost-sharing aid under the Watershed Protection and Flood Prevention Act (Public Law 566). The proposed 5,590-acre Silver Lake-Locust Island Project quickly became the first of its kind in New Jersey and the first, nationwide, to receive Farmers Home Administration watershed loan financing.

The protection plan, prepared with Soil Conservation Service technical aid, provided for more than 3 miles of dikes to be built around the watershed. They were designed to withstand tides 3 feet higher than any on record. New gates were built to halt incoming

The village of Hancock's Bridge is surrounded by water and depends on dikes to block out Delaware Bay tides.







Tide gates like this one on Silver Lake Dike keep tidewater out and let excess water out at low tide.

tides, and then open automatically to allow normal fresh-water drainage, and control water levels in the watershed. The project was completed in mid-1962.

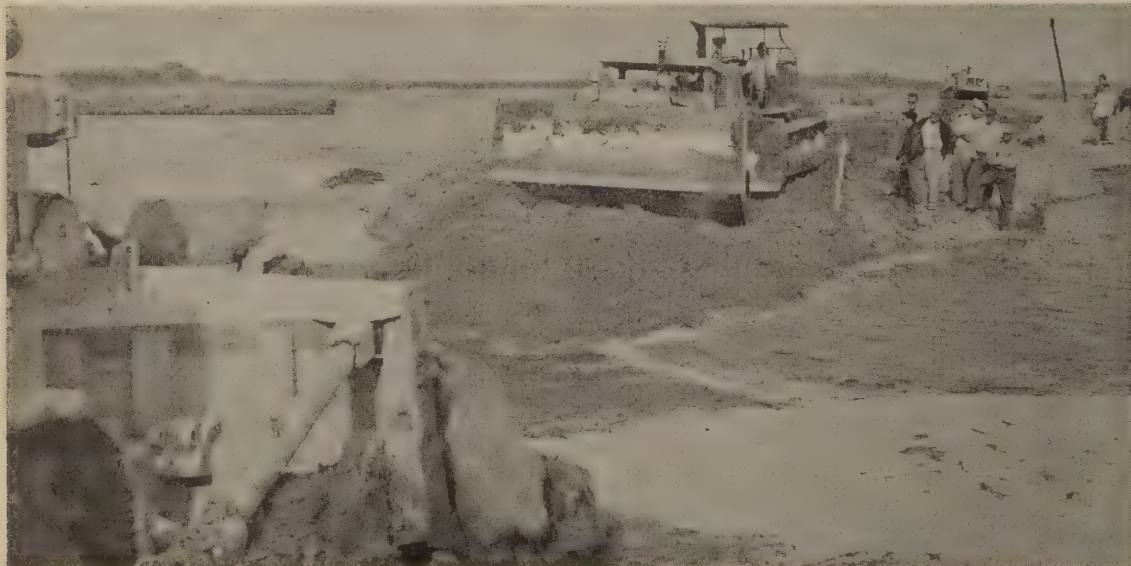
### Primary Aims

"Restored farm incomes and the return of profitable muskrat trapping were the primary aims of the watershed project," notes Hugh Watts, SCS work unit conservationist in Salem County. "The community has already found overseas fur markets. Growing demands for pay-as-you-hunt areas have pushed the benefits well above the predicted estimates."

John Pancoast added several hundred dollars to his income by renting hunting rights for his land to a sportsmen's club. This is



Center of the flood problem was a 200-foot gap in the dike (above) caused by a hurricane. Rebuilding the dike (below) was a major step in the watershed project.





only one of several similar farmer-sportsman projects in the watershed. Three landowners in the Silver Lake part of the watershed have built duck hunting blinds in their marsh holdings. One operator rents 10 blinds for \$100 to \$125 each a season. With demands for blinds increasing yearly, other landowners plan to enter the business next year.

### Trapping Thrives Again

Keeping pace with the pay-to-hunt business, muskrat trapping has started to flourish once again. New European fur markets have overtaken shrinking American outlets for the pelts to boost prices up to \$2 a pelt. Per-acre trapping incomes, still below preflood averages for the 1,200-acre marsh, will reach

\$10 to \$15 in a year or so, according to local trappers.

### New Source of Income

To the pelt income, trappers add 20¢ a carcass from Baltimore wholesale meat markets and from local buyers. A large part of local consumption stems from annual muskrat dinners put on by a local fire department. These attract hundreds of outsiders each fall and winter.

"Some of our better trappers set out 40 to 50 dozen traps and average 100 skins a week during the season," says Lewis W. Fogg, manager of the Thorofare Meadow Company. "This is quite an addition to our local farm-based economy."

On the home farm, Lewis Fogg



Fish (above) were John Pancoast's only crop on flooded farmland.

The rebuilt Silver Lake Dike (l.) weaves through twisted backwater streams below Hancock's Bridge.

Lewis Fogg (l.) and Hugh Watts of the SCS (r.) look over Fogg's harvest of common reed hay on a formerly flooded field.

Better muskrat harvests (below) draw visitors to the annual fire house dinners.







Edward Fogg's tomato harvest is an example of the renewed farming activity around Hancock's Bridge made possible by flood protection.

has found a new source of income related to improved water-level control in the watershed.

"A 15-acre field along the edge of Silver Lake was always too wet," says Mr. Fogg. "This year we were able to get on the land to cut an average of 100 bales an acre of common reed (*Phragmites*). The grass is cut early and is ideal for bedding. Also, it has a protein content comparable to alfalfa. We sell it for \$1 a bale, and there's a big demand for it in this area. Besides that, we trap a number of muskrats on that same land in the winter. That's what I call good land use!"

Hancock's Bridge found a real community benefit with watershed protection. Mosquitoes, the plague of Jersey lowlands, are being exterminated. Nine miles of mosquito-control ditches are being dug in the watershed by county health authorities. Ditches and spray applications were impractical under previous flood conditions.

As manager of the Thorofare Meadow Company, Lewis Fogg

cites an interesting financial feature of the \$35,000 FHA watershed loan.

"Members of our company are assessed for our mutual land improvement costs," Mr. Fogg explains. "In past years our tax rate had gone as high as \$20 an acre. Now, even with the payments of the FHA loan, our assessment is down to \$2 an acre. Dike repairs that cost us plenty each year are not needed. Maintenance is a small item with the watershed protected, so our assessments are down."

### More Land Treatment

Conservation land treatment, an important part of watershed planning, has already exceeded minimum requirements of the watershed plan, says Conservationist Watts. Farmers, profiting from flood-free dependable crops, are investing more money each year in conservation measures. Erosion control is a big factor in maintaining the new ditches. These conservation efforts are also building land values and the community's

economy.

The project's ability to hold off storm tides and floods has already been tested. Two storms, both nearly equal to the disastrous 1955 hurricane, failed to top the new dikes. Farmland, wildlife marshes, and Hancock's Bridge were protected in both cases.

Folks at Hancock's Bridge look forward to even greater area development of the land, water, and wildlife resources as the key to flood-free community prosperity. ♦

### Plants for Shooting Fields

The following plants are recommended for shooting fields in the Northeast and Corn Belt. Sudangrass, sorghums, corn, millets, buckwheat, soybeans, domestic grasses, switchgrass, Reed canarygrass, sericea lespedeza, and shrubs. Since row planting of sudangrass, sorghums, corn, and switchgrass may encourage undesirable running by pheasants, crossrow drilling or broadcast planting at the ends of strips is recommended. ♦



# Many New Landowners and Farmers Plant Shrubs for Wildlife

By **David N. Allan**  
*Biologist, SCS, Durham, N. H.*

**P**LANTING shrubs in New Hampshire, which is about 85 percent wooded, is like "bringing coals to Newcastle." But with people moving out into the country a renewed interest in nature and wildlife is growing, and many shrubs that were weeds to the farmer are a thing of beauty to new landowners. Farmers, too, are spending more and more time on wildlife preservation.

In conservation planning excellent wildlife habitat can be created by using materials close at hand. These species are already adapted to the area, and by knowing the soil and moisture needs of plants transplanted from the wild, the landowner can do much to improve his property.

## New Type of Landowner

The Marshall Daltons of Sharon, examples of the new type of landowner, built a new home in an old hayfield overlooking Mt. Monadnock. Having an interest in birds and a desire to retain a natural setting, they turned to their woods.

They landscaped their home with highbush blueberries as a foundation planting and white birch and red pine for contrast of color. The blueberries feed the birds in summer and the pine provides shelter in winter.

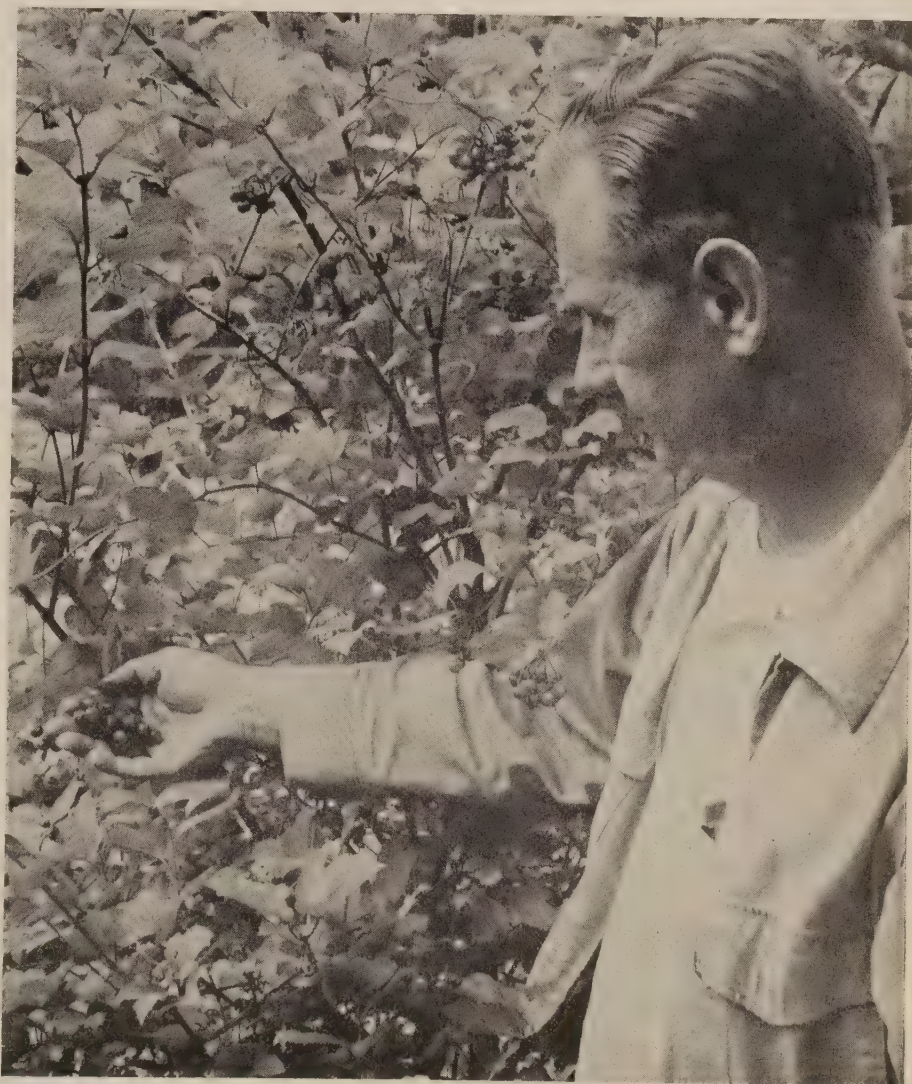
For year-round color and wildlife food, they produced specimen shrubs from small whips of alternate-leaved dogwood and mountain holly that had been mulched and fertilized, and they carefully pruned and fertilized a large

clump of staghorn sumac. The result: Dogwood bursting in a mass of white blossoms in June; mountain holly covered with scarlet fruit by August; sumac, a weed to many people, brilliant with red

foliage in the fall and offering its fruit to passing birds in the winter.

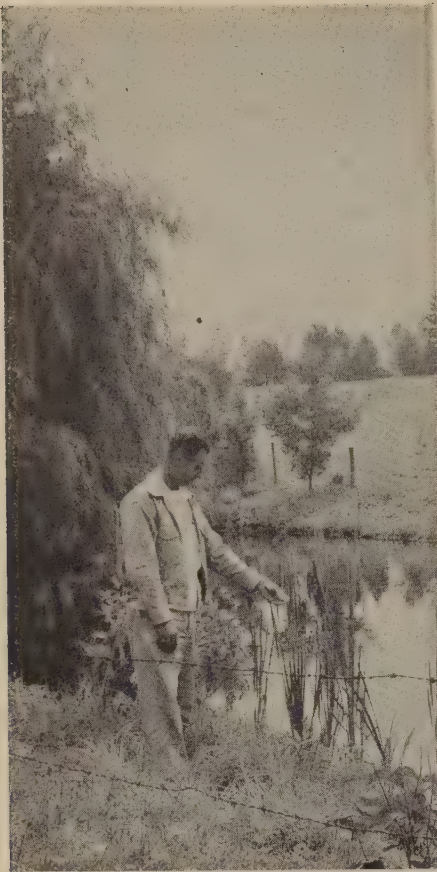
The Daltons planted native highbush cranberry around their small farm pond. Its red fruit hangs on well into the winter months to serve as a crash diet when wildlife food is scarce. By cutting out competing trees and fertilizing, they have released old apple trees, nannyberry, and other shrubs. The fruit crop thus produced is terrific.

Another new landowner, the Winthrop Browns on Jarmany Hill, restored an old Cape Cod farmhouse. By selective cutting and releasing in their woodland, they encouraged the shrubby undergrowth and increased the bird



SCS Work Unit Conservationist Johnson for the Hillsborough Soil Conservation District holds some of the fruit from highbush cranberry planted for wildlife around Jeff Smith's stock pond.





Fenced stock pond has been improved for wildlife by shrub plantings. Rotated pasture is in background.

population. From Mrs. Brown's interest in the preservation of wildlife, flowers also have been increased or introduced. The Browns have developed a series of trails through their woods for bird watching and the study of native plants.

### Shrubs Around the Pond

Around a pond they planted native shrubs and trees and along one side a wildlife border of autumn olive, a tatarian honeysuckle, and highbush cranberry. Here they can see the yellow flash from a warbler nesting in the shrubs or the splash of a rising trout and hear the song of a wood thrush, or they can see the print made by a deer coming down to drink or the spot where a coon has washed its meal.

Jeff Smith of Hollis has sold the dairy end of his farm to his

nephew Robert Hackett and has taken time from a busy life to plant shrubs, put up bird houses, and generally care for the wildlife that comes to make a home there. In practicing good soil and water conservation he has built his land into a top winner in the State Green Pastures Competition. Also from excellent wildlife management he has openland birds and animals in alfalfa and stripcropped fields; brown thrashers, catbirds, yellow warblers, song sparrows, flycatchers, and many other birds in 2,500 feet of living fence; and for pheasants, rabbits, squirrels and birds he has fruits in winter.

### Outdoor Schoolroom

Along one cattle lane next to a new high school Mr. Smith planted native dogwoods and viburnums. This lane has served as an outdoor

schoolroom. Groups such as garden clubs, bankers, and soil conservationists have visited the area to study conservation and wildlife.

In his 155-acre woodlot he carries out a program of continuous management. He girdled wolf trees and left them for dens, group-cut mature pine to provide food for grouse and deer, and released wild apple trees for food. He planted shrubs around waterholes used for fire protection and by ducks and other shorebirds. A den tree on the shore of his farm pond shows the work of pileated woodpeckers.

These soil conservation district cooperators with the Yankee spirit of "make do with what you have," plus the use of introduced shrubs, have established attractive wildlife practices on their land. Both man and wildlife have benefited from their effort. ♦

## Wildlife and Natural Resources Conference Is Conservation Forum

The challenge of "Statesmanship in Our Changing Environment" is the theme of the Thirtieth North American Wildlife and Natural Resources Conference in Washington, D. C., March 8 to 10.

Conservationists from the United States, Canada, Mexico, and other countries look to this annual event as one of the major forums for discussing a wide range of conservation problems, according to Lawrence V. Compton, head biologist of the Soil Conservation Service. Several SCS biologists and Administrator D. A. Williams are participants in the program.

The conference opens with a general session on "Public Responsibility for Resource Policy." Following this are 6 technical sessions on significant developments in wildlife management and research. A concluding general session on "Today's Opportunities—Tomorrow's Needs," features techniques and philosophies that may help as-

sure future generations of adequate natural resources. In all, more than 45 speakers are scheduled to address the conference.

This international conference had its origin in the American Game Conferences, first held in 1915. In 1936, President Roosevelt called the history-making North American Wildlife Conference, and this annual meeting of conservationists was continued under that name for a quarter century.

To better indicate the wide interest of the persons who participated, its name was changed in 1960 to the North American Wildlife and Natural Resources Conference.

Although wildlife continues to receive major consideration, the conference is concerned with soil, water, forests, and related conservation fields. Each year the program is developed by a committee representing major conservation organizations of the continent. ♦



## Ohio Agency Gives Wildlife Award

**T**HE Ohio Division of Wildlife has begun an annual Wildlife Conservation Award Program to honor farmers for outstanding contributions in providing recreation to sportsmen and in fostering good will between farmers and sportsmen of the State.

Selection of winners is based on the level of wildlife management practices applied and availability of hunting and fishing.

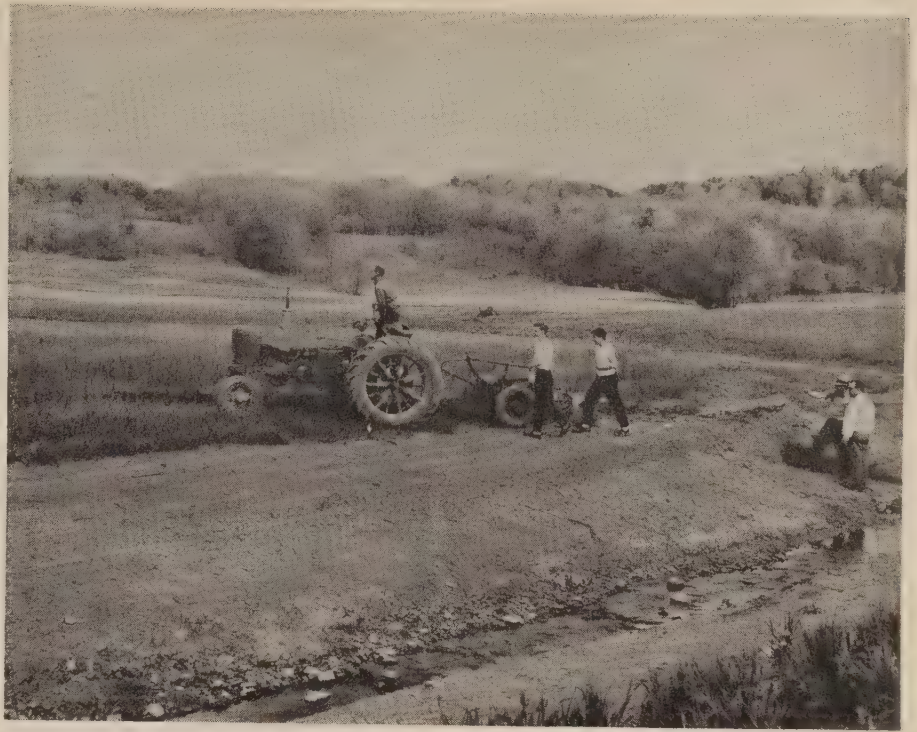
One of the five winners for 1964 was Lyn Newnham, a Holmes Soil and Water Conservation District cooperator and supervisor for 12 years. Newnham's farm conservation plan, developed with help of the Soil Conservation Service, includes many measures for improving wildlife food and cover.

Newnham was one of the first in Holmes County to sign an agreement with the Ohio Division of Wildlife to permit hunting on his land, and the first to permit quail hunting.

Governor James Rhodes, in awarding a silver bowl to Newnham, said: "This is one of the outstanding examples of what farmers can do to provide hunting and fishing opportunities for nonfarm people. Newnham has done an outstanding job of maintaining and improving his land and developing food and cover for wildlife. We would like to see more just like this in each county in the State of Ohio." — ADRIAN ACHTERMANN, *Work Unit Conservationist, SCS, Millersburg, Ohio.*

### A Shooting Field

The best site for a shooting field is an open area of 25 to 75 acres with level to gentle slopes and fertile soil. Cover plants for upland game birds are essential but food plants are of little importance, says "How To Plan a Shooting Field in the Northeast and Corn Belt" (USDA Agr. Leaflet 532). ♦



Contour stripcropping, crop rotation, and field consolidation are visible on the 75-acre vocational agriculture conservation area at Moravia, N. Y., as instructor and students prepare for corn planting.

## Moravia Students Learn Conservation On School Demonstration Farm

**S**TUDENTS at Moravia, N.Y., Central School are learning about land and water conservation practices just by attending regular classes each day.

On the school grounds and through their classroom windows, the students see crop rows in contour strips, examples of crop rotation, well-managed waterways, and improved woodlands. Teachers explain that these features protect the school grounds from erosion and flooding, protect the soil, water, woods, and wildlife, as well as provide beauty to the landscape of the 75-acre area.

### An Outdoor Laboratory

The conservation program at Moravia Central provides an outdoor laboratory for vocational agriculture, biology, and earth sciences classes.

Leader in this program to bet-

ter acquaint the youth of Cayuga County with the natural phenomena at work around them and man's role in conserving the land is Charles F. Whiteman, head of Moravia's vocational agriculture department.

Whiteman and Charles R. Barnett, SCS work unit conservationist, planned and developed the demonstration area of coordinated conservation practices. Students helped in the 3-year effort.

Whiteman feels that experience with the conservation project has been vitally important to the farm-oriented young men. And, the managed property has given the local chapter of Future Farmers of America space to multiply their activities.

Planning under Barnett's guidance was based on examination and mapping of the soil and its needs. From this information, students





Moravia's vocational agriculture teacher, Charles F. Whiteman (l.), and students Bruce Langerlan and Leigh O'Connor rig up a "clodbuster" in preparation for corn planting on the school's conservation farm. The new elementary school is visible in the background.

gained an understanding of subsequent changes in land use, vegetative and mechanical treatments, and the measures required to get the area into top production.

Water control had top priority. Students helped to build a complex system of tile drains and sod waterways and open ditches. Measures such as filter strips of hay and grain and debris-dams furnished an object lesson in controlling erosion.

Students have been kept busy in the school's machine shop, repairing and altering equipment to use in larger consolidated fields developed by removing old hedge rows and obstructions.

Whiteman and Barnett point proudly to contour strips, diversion ditches, and grassed waterways on surrounding farms in the Cayuga Soil and Water Conservation District that can be traced to students who worked on the school project.

Whiteman believes the boys have benefited greatly by their partici-

pation in local, State, and Federal agency conservation programs. They learned what each agency has to offer, and the requirements to qualify for acreage allotments, credit, and cost-sharing.

Meanwhile, Moravia school children are learning that their town, county, State, and Nation really do care what happens to America's most precious resources. ♦

## Grange Tour Shows Conservation

**M**ORE than 750 eighth grade students and their teachers in the Flathead Soil and Water Conservation District in northwestern Montana have completed another successful Grange Conservation Tour. Each year, since 1952, the eighth grade groups have had the chance to see soil and water conservation at work on the farm and ranch lands of their community.

The students learn how the

area's soils can best be used and protected. They learn about irrigation and keeping water supplies pure. And they learn that soil, water, and wildlife conservation is as important to those who live in the cities and towns as to those who live on farms and ranches.

The Flathead District, the county Extension Service, the Forest Service, the Montana State foresters, and the Montana State Fish and Game Department provided instructors on this tour.—LEWIS FULLER, *Work Unit Conservationist, SCS, Kalispell, Mont.* ♦

## Bluestem Grass In a Black Wrapper

**"J**UST marketing bluestem grass in a black wrapper" is the way Paul Seeley, Jr., manager of the J-Bar-J Ranch near Eureka, Kans., looks at their conservation ranching operation.

The 9,000-acre ranch with its Angus cowherd, owned by D. R. Lauck, is a model of range and livestock management under a conservation plan in the Greenwood County Soil Conservation District.

A program of light stocking and deferred grazing in summer, based on a range inventory made with the help of SCS, restored the bluestem grass from the depleted condition when Seeley became manager in 1956.

Good grass management is essential to herd improvement, Seeley says.—SY EKART AND LEO BROWN, *Soil Scientist and Soil Conservationist, Eureka, Kans.* ♦

## Preservation of Wildlife

In all its activities, SCS seeks to avoid unnecessary damage to wildlife and to favor the increase of beneficial species as a corollary result of land use and soil and water conservation practices. ♦



## Larger School Properties Provide for Outdoor Laboratories

**A** trend toward larger sites for school buildings is bringing new opportunities for outdoor education and new demands for conservation assistance on school grounds.

Public school officials and the Soil Conservation Service in many places are recognizing these opportunities and are working together to take advantage of them.

As a result, schools that formerly had to haul children by bus to outlying parks and natural areas for outdoor instruction now are using outdoor laboratories right on their own grounds. In so doing, they avoid loss of valuable time of teachers and students, the expense of transportation, and the complications of necessary insurance and safety precautions.

### 50 Acres and Up

Entries in the annual School Building Architectural Exhibit of the American Association of School Administrators show that school officials are buying larger sites each year. In the 1964 entries at Atlantic City there were 31 schools with sites of 50 to 100 acres, 12 schools with sites of between 100 and 200 acres, and 2 junior college sites with 247 acres and 400 acres, respectively.

This trend is continuing. Here are some of the entries selected in the 1965 School Building Architectural Exhibit: Senior High School, Oneonta, N. Y., 130 acres; Alpena Senior High School, Alpena, Mich., 80 acres; Starmont High School, Strawberry Point, Iowa, 80 acres; Colerain Senior High School, Cincinnati, Ohio, 58 acres.

Schools are buying these larger sites even though prices of land

have gone up. They are buying them in the face of considerable difficulty because of the increasing competition for land by urban developers.

It is interesting to compare the size of school sites now with that recommended by the American Association of School Administrators in their 1949 year book, "American School Buildings." Quoting from that book; "Most school sites are too small. Larger areas are necessary, because of the continued expansion of education-programs . . . The following site areas are suggested as a minimum: (a) For elementary schools, 5 acres plus an additional acre for each 100 pupils. Thus an elementary school of 200 pupils would have a site of 7 acres. (b) For secondary schools, 10 acres plus an additional acre for each 100 pupils. Thus a high school of 500 pupils would have a site of 15 acres."

### For Outdoor Education

The judging committee for the 1964 School Building Architectural Exhibit pointed out that far too little attention has been given to developing the outdoor education potential of many excellent school sites.

Fortunately the opportunity to plan and manage these larger sites for conservation education and outdoor learning opportunities is not going unnoticed.

In Michigan, the Soil Conservation Service has prepared conservation plans based on soil survey information for many school sites in the same way that it assists farmers. The plan for the 80-acre site of the Gwinn Public Schools is a good example of how a conservation plan can be adapted to a

school's needs.

The Gwinn conservation plan includes a woodland with trails to serve as a day camp location. It includes a wildlife area with a pond for aquatic life study and a bog garden for identification and collection of bog and marsh plants and associated animal life for nature study, biology, and conservation. A windbreak protects the area on two sides. This is only one of many such plans.

### SCS Helps Educators

Allan Collins, State Conservationist for SCS in Michigan, has instructed his field staff to give assistance to school boards and others. Requests are forwarded to the State Office for review. A subcommittee of the Conservation Education Committee of the State Department of Public Instruction met with Mr. Collins' staff, and at that time informal agreement was reached to provide SCS technical assistance to schools for conservation planning.

Clarence Engberg, State Soil Scientist, SCS, has been serving on the Conservation Education Committee of the Michigan Department of Public Instruction.

Dr. Shirley Cooper, Director of Inservice Education, American Association of School Administrators, said recently that schools everywhere will welcome SCS help in planning school sites.

"We know" he said, "that there are natural areas on these sites that should be left undisturbed and that the conservation of the soil, water, woodland, and wildlife resources must be planned. We in AASA have persuaded schools to buy bigger sites and now they don't always know what to do with them. We know that conservation education, nature study, and other outdoor learning activities are needed in the school program. Here is our opportunity to establish the basis for this right on the school property. We must not miss this chance. ♦



## State Reformatory Is Site of Unique Pipeline

THE Colorado State Reformatory for young men, situated in the heart of the Rocky Mountains, is the site of a unique irrigation system. Water for 650 acres of fertile reformatory cropland must be piped across the Arkansas River on its way from Cottonwood Creek, a tumbling mountain stream.

When the system was first developed, irrigation pipe spanned the Arkansas on a wooden bridge that had once been a road crossing. The pipe, an inverted siphon, carried the water from the creek down a long slope across the bridge and up a hill on the outlet side.

Today's engineers would have condemned the makeshift arrangement, but it served the purpose for many years until the bridge timbers began to rot and maintenance

became expensive and dangerous.

Cables and piles in various arrangements were installed to support the bridge, but by 1959 the structure had deteriorated to the point where it seemed on the verge of collapse.

Contractor Irving W. Avery, of Buena Vista, began construction of the siphon in April 1963 after SCS engineers completed field surveys to select a site for the new structure.

It took a month to complete the siphon. It required 66.7 cubic yards of reinforced concrete to support the 378.5 feet of pipe spanning the river at an elevation of 22 feet above the water.

Reformatory officials are confident the new system will solve their irrigation problem for many years and enable the farm-live-stock operation to make a contribution in the rehabilitation of inmates.—A. G. CROOK, *Work Unit Conservationist, SCS, Salida, Colo.*

## A Great Plains Snowscape

Effectiveness of conservation practices in holding precious moisture uniformly on Great Plains cropland is shown by this photo of a terraced and contoured field after a light snow. The owner,

Gilbert Bollwinkel, of Burlington, Colo., is a cooperator with the Burlington Soil Conservation District. His 3,680-acre farm is covered by a Great Plains Conservation Program contract.



## Litterbugging

ONE of the most popular activities engaged in by 99 percent of the entire population of the United States is known as *Litterbugging*.

It is usually engaged in while driving for pleasure. Other than a car, an open road, and the beautiful outdoors, no particular equipment is required. An empty beer can is most helpful. It is believed by some that the beer can is the most useful equipment of the car-borne Litterbugger.

Income has no bearing on participation in the sport of Litterbugging. It has been reported that those driving Cadillacs and Continentals are as active as those driving Fords.

Urban areas, rural areas, and large cities, national parks, national forests, State parks, and State forests are all equally excellent sites for the sport of Litterbugging.

It is not necessary to have a car to participate. A city street and a stick of gum can help the Litterbugger in the city areas.

There does appear to be a small segment of the population of the United States that is trying to suppress the sport of Litterbugging. They are going so far as to have laws passed that will fine Litterbuggers.

But Litterbuggers are smart; they don't usually get caught. That small segment of the population attempting to wipe out the sport of Litterbugging is even using the media of television and radio in their campaign.

Who knows, maybe they will come up with a pesticide that will stamp out Litterbuggers. It might be known at *Littercide*.—Mrs. HELEN GUTHRIE, *Branch of Land Operations, Bureau of Indian Affairs.*

One of the most neglected tools in farm business is records.



## SCS Has Unofficial Role Under Economic Opportunity Act

Although the Soil Conservation Service has no direct responsibility under the Economic Opportunity Act, its personnel share an obligation to help wherever possible to carry out provisions of the act.

This was the concensus from participants in the 22d annual conference of the Professional Agricultural Workers Association meeting at Tuskegee Institute in December.

The conference theme was "Im-

plications and Implementation of the Economic Opportunity Act of 1964." Participants included speakers from the Office of Economic Opportunity, the Department of Labor, and several agencies of the Department of Agriculture.

Setting the keynote on SCS responsibility in the new poverty program was Herschel E. Hecker, assistant to the associate administrator.

According to Hecker the broader

aspects of the act provide an opportunity for each individual to make a contribution.

SCS will work with soil conservation districts in total community planning to eliminate poverty, said Hecker. He cited Title I, part B of the act, under which soil conservation districts can offer training situations which would put local youths to work and provide work experiences that would make them employable.

Title II was described as an opportunity to use soil and water resources as a foundation around which a sound community action program can be developed.

Other conference speakers noted the close relationship of SCS work unit conservationists with local rural people. The SCS conservationists might play a valuable communications role between the Office of Economic Opportunity and "boxed-in" rural folk who have no hope of economic improvement and who otherwise might be overlooked.

The Department of Agriculture gets specific responsibility in this program under Title III which provides for small loans and grants to poor rural families. The Farmers Home Administration is responsible for its administration. ♦

## Scouts Get Conservation Lessons



Boy Scouts at Camp Salmen clean out an old swimming area on Bayou Liberty which they will fertilize and stock with fish. The Scouts are earning their merit badge in soil and water conservation.

**B**OY Scouts in the New Orleans Area Council are learning the importance of soil, water, and wildlife conservation through the cooperative efforts of Scout Counselor Jim Whelan and SCS Work Unit Conservationists Stafford Thibodeaux, Neil Bullock, Jim Loe, and Zeke Williams. Scouts who learn their lessons well earn a merit badge in soil and water conservation.

Their "classroom" is Camp Salmen, a 150-acre tract across Lake Ponchartrain from New Or-

leans. Last summer, the Scouts cleaned up an area along Bayou Liberty. They plan to fertilize it and stock it with fish. The Scouts have mulched eroded land, built check dams, and improved the grass cover at the camp.

Many New Orleans boys are learning to appreciate the value and beauty of their region's natural heritage while enjoying the outdoor life at Camp Salmen.—  
JOHN M. CROSS, *Assistant State Conservationist, Alexandria, La.* ♦

## Louisiana Honors Conservation Teachers

A program of recognizing teachers for relating conservation of natural resources to the subjects they teach is conducted by the Louisiana Association of Soil and Water Conservation District Supervisors.

Winners for 1964 were honored at the association's annual meeting in January. First award of \$100 cash and a plaque went to Mrs. Juanita Sommers, Baton Rouge.

Mrs. June Moore, Midland, and Mrs. Ruby Blaylock, Bastrop, tied for second. Mrs. Delores Sapp, of Start, placed third. They received plaques.





**Wildlife Management and Conservation.** BY JAMES B. TREFETHEN. 1964. D. C. Heath and Co., Boston. 120 pp. \$1.26.

Because much of our wildlife makes its home on privately owned land, farmers and ranchers have reason to know that there are people and agencies concerned with the management of this natural resource.

Since they are producers of wildlife, many landowners have felt that they would like to know more about its management. But it has not been easy for the nonprofessional to obtain such knowledge.

There are numerous textbooks on wildlife management, but all are lengthy, detailed, and a bit expensive. There simply has been no easily available, short, simply written statement of the reasons, objectives, and principles of managing wildlife. This little book by Trefethen is that kind of a statement. It consists of 6 short chapters, each of about 20 pages.

The first chapter outlines the historical background of modern wildlife management. Chapter 2 discusses habitat, how each kind of wildlife requires a specific kind of habitat, and how the wildlife manager goes about developing habitat for a desired kind of wildlife. Chapter 3 treats of wildlife populations, and chapter 4 describes research findings and their applications. Chapter 5, with the title of "Tools and Panaceas," discusses the uses and misuses of several time-honored wildlife management techniques, including stocking, winter feeding, and wildlife refuges. In the short, final chapter of the book, the author tells how extinction faces many wild species throughout the world and of the heroic efforts being made to save them.

This book is a clear exposition

of a complex subject and is offered at a bargain price. I recommend it to anyone interested in wildlife. —LAWRENCE V. COMPTON, *Head Biologist, SCS.*

**Natural Resources For U. S. Growth.** BY HANS H. LANDSBERG. 1964. *The Johns Hopkins Press, Baltimore.* 260 pages, charts; paper. \$1.95.

This paperback book summarizes a study of America's resource needs to the year 2000 and of the supplies available to meet the demand. It is a neat digest of Resources for the Future's 1,040-page study of demand and supply prospects for the next 40 years, "Resources in America's Future." Much of the information is shown in charts, graphs, and diagrams for easy and quick comprehension.

Discussed under future requirements are such items as the kinds of food expected to be used, fibers, construction, durable goods, metals, paper, forest products, and the uses of energy. Then the adequacy of water, land, energy, and non-fuel minerals to meet future demands is appraised. The final chapter, "Some Major Issues of Policy," summarizes the problems involved, where shortages are likely to occur, and where conscious developments are needed.

This book provides a broad understanding on how our natural resources are interdependently utilized for the benefit of all the people. It will be useful to conservationists, economists, physical scientists, plant scientists, and all who are interested in the best available data bearing on U. S. growth. —T. A. NEUBAUER, *Resource Development Division, SCS.*

## New Publications

**What Is a Ranch Conservation Plan?** BY THE SOIL CONSERVATION SERVICE. 1964. *USDA, PA-637.* 8 pp., illus. Some of the things for the rancher to do in preparing his ranch conservation plan are: (1) Appraise the soil, water, plant, and animal resources on the ranch; (2) identify soil, plant, and water problems and opportunities for improvement; (3)

consider alternative land uses and conservation treatments; and (4) evaluate the costs and benefits of alternative treatments. The leaflet describes the assistance available from the SCS, through local soil conservation districts, in making a plan to suit an individual ranch. It gives an example of a ranch conservation plan and itemizes the benefits ranchers have reaped by following such plans.

**Threads of Life.** BY COMMITTEE ON EDUCATIONAL POLICY IN AGRICULTURE. 1964. *National Academy of Sciences—National Research Council.* Washington, D. C. 16 pp. This attractive brochure tells of the need for more agricultural scientists in the future. It tells how a young person can pursue such a career through knowledge of the basic biological sciences. Written for talented high school students and their advisers, the booklet is available only from colleges, schools, and departments of agriculture in institutions of higher learning.

**County Action for Outdoor Recreation.** 1964. *National Association of Counties and Citizens Committee for the Outdoor Recreation Resources Review Commission Report.* Washington, D. C. 48 pp., illus. Opportunities for action by local units of government, reviewed here in terms of counties, are similarly open to soil conservation districts.

**Salt Tolerance of Plants.** BY LEON BERNSTEIN. 1964. *USDA Agr. Inf. Bul. 283.* 23 pp., illus. Information on measuring salinity, its effects, and management in relation to salinity control.

**Winds Over Wildlands—A Guide for Forest Management.** COMPILED BY CHARLES C. BUCK. 1964. *USDA Agr. Hdk. 272.* 33 pp., illus. Well-illustrated publication on wind behavior.

**Resource Requirements on Farms for Specified Operator Incomes.** BY HAROLD E. BARNHILL. 1964. *USDA Agr. Econ. Rpt. 5.* 55 pp., illus. The revised report includes analyses for major types of farming in the 15 areas described in the previous report and for 14 additional areas.

**First Aid for Flooded Homes and Farms.** 1964. *USDA Agr. Hdk. 38.* 28 pp., illus. Hints for clearing, rebuilding, and reducing losses caused by floods.

**Pondweeds and Pondweedlike Plants of Eastern North America.** BY NEIL HOTCHKISS. 1964. *U. S. Dept. Interior Circ. 187.* 30 pp., illus. First of a series of publications on the field identification of the marsh and water plants of Eastern North America. ♦



From the Administrator:

## *Farm Game • Conservation Districts Wildlife for Everyone*

**A**GRICULTURAL land of the United States produces a wildlife crop commonly referred to as "farm game": the squirrels, rabbits, quail, pheasants, doves, and other species commonly hunted on farms and ranches. These kinds of wildlife are generally favored by soil and water conservation practices carried out by cooperators in soil conservation districts and can be further increased by specific wildlife management measures.

I am told by wildlife biologists and administrators, however, that the management of farm game on a statewide or regional basis is one of their most perplexing problems.

Reliable techniques for increasing specific kinds of farm game have been known for years. And these management measures are being used by interested land operators on thousands of individual farms and ranches. The problem is to get them applied over large areas involving many and varied ownerships.

This is not a new problem in wildlife management. It was recognized many years ago, but practical ways of tackling it have only recently become available. The first requisite is to provide the landowner with incentives to have more wildlife and to want to make it available to the public. Paying him for the privilege of hunting on his land appears to be this kind of incentive. At least it is being tried in more and more States and many game officials are watching its development with hope.

Paying the landowner for the right to hunt on his land has several practical benefits: (1) It increases hunter opportunities by

opening lands that otherwise are posted against hunting; (2) the economic return gives the landowner a reason for practicing game management; and (3) by placing farmer-sportsmen relations on a business-like basis, it reduces the misunderstanding and distrust that too often have prevailed between the hunter and the farmer.

Fully developing this or any other means of obtaining game management on privately owned lands calls for increased efforts and closer cooperation from interested agencies and organizations. More technical information on wildlife management and more encouragement to produce it must get to the producers. The soil conservation district is proving to be an effective medium for this cooperative effort.

**S**OIL CONSERVATION districts blanket the Nation. There is one in nearly every county and they include fully 95 percent of the farms and ranches. They are the recognized local source of help and information on resource management for landowners and operators.

Most districts look to public and private sources for assistance in preparing their conservation programs and in putting them into effect on individual farms and ranches. Herein lies the opportunity for all agencies, whether public or private, that genuinely wish to aid in the conservation of wildlife.

The Soil Conservation Service is one of the agencies providing technical assistance to soil conservation districts, including guidance in the planning and application of prac-

tices that improve wildlife habitat. To assure the highest technical quality in this service, SCS employs wildlife biologists who train the conservationists that work directly with the land operators. In developing, adapting, and applying techniques of wildlife management, SCS biologists work closely with Federal and State wildlife agencies.

The Soil Conservation Service will continue to encourage farmers and ranchers to improve their lands for wildlife production and will continue to seek the cooperation of other agencies in this effort.

**W**ILDLIFE is not for hunters alone. It has many values for many people, and this fact makes every kind of bird, mammal, fish, insect, or other creature that lives on agricultural land of concern to the Soil Conservation Service.

As the Department of Agriculture broadens its objectives to better serve the interests of all people, the guidance SCS provides in the use of natural resources reaches to wider horizons. Our conservationists are as ready to suggest ways to improve the environment for nongame species as they are to aid in producing and harvesting a game crop. And they are finding landowners equally responsive to the challenge of wildlife conservation for esthetic and recreational reasons.

The technology of conservation can serve the finest goals of rural beauty and preservation of nature as well as the practical purposes of wildlife production.

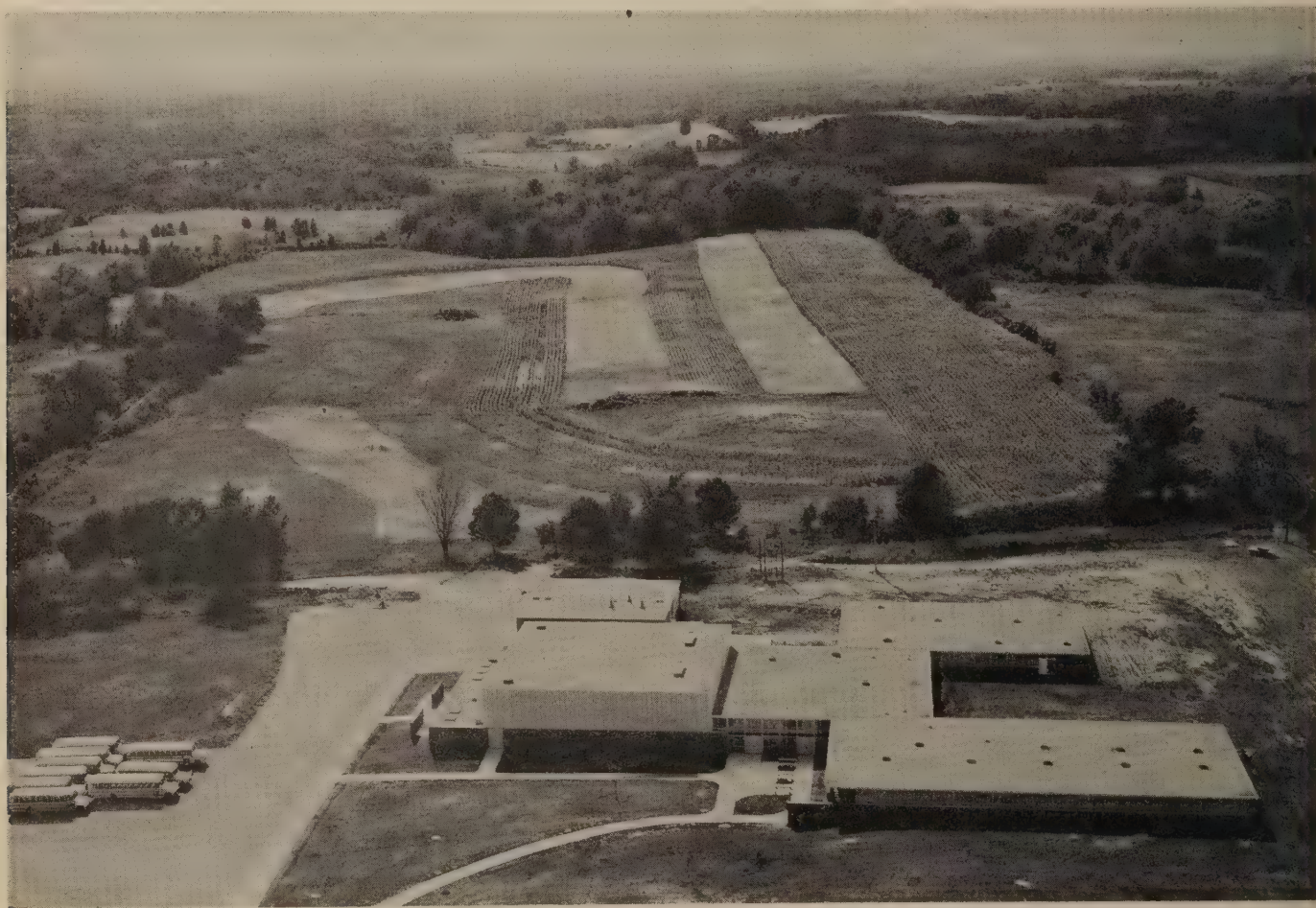
—D. A. WILLIAMS



If your address changes, please notify us of your complete new address, including Zip Code number, and include old address with our code number as shown above.

## Room for Outdoor Learning

Story on page 187



Many schools now purchase large acreages for school sites and prepare a conservation plan with SCS assistance. The Central Montcalm High School at Montcalm, Mich., is

located on a tract of 145 acres and the stripcropping in the background is included in the conservation plan. Other practices are tree planting, woodland manage-

ment, and soil management. The conservation plan provides training for vocational agriculture and other students in practical aspects of conservation. ♦



16  
035

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

# Soil Conservation

APR 15 1965

CURRENT SERIAL RECORDS

APRIL 1965  
VOL. XXX NO. 9

## SMALL WATERSHED PROJECTS

*Land Use Adjustment and Land Treatment—Page 195*

*Recreation—Page 198*

*Economic Development—Page 199*

*Local Participation—Pages 207, 209*





# Soil Conservation

## *Unanimous . . .*

This issue of *Soil Conservation* should erase any doubt that land treatment, rather than structures, are the foundation of watershed protection. The President (p. 213) asks for enhancement of the beauty of the American landscape; the Secretary of Agriculture (p. 213) points out that USDA conservation efforts (like watershed projects) apply to the 85 percent of the landscape controlled by private land owners and operators; the Administrator (p. 215) restates SCS policy aiming at full treatment of watershed lands; and the Director of Watershed Planning (p. 195) spells out the benefits of conservation measures in adjusting land use and reducing runoff and erosion damages.

The message is plain: Get conservation on *all* the land as fast as possible.

**Economics:** Besides bringing stability and beauty to the uplands and safety to the valleys, small watershed projects bring new economic life to rural communities. SCS Engineer Samuel Cole provides an example in the story of the Roanoke Creek project, Va. (p. 199).

**Cover:** The community recreation potentials of small watershed projects are illustrated by Boy Scouts using a lake in the South River subwatershed of the Potomac.



## CONTENTS

- 195 Watershed Land Treatment**  
Land use changes reduce cropland  
*By John H. Wetzel*
- 198 Teamwork at Holly Springs**  
Watershed project in a National Forest  
*By W. L. Heard*
- 199 More Water, More Business**  
Watershed project paves way for community growth
- 201 Pines Like Money in Bank**
- 203 Behind the Scenes**  
On a watershed construction job  
*By P. E. Nylander*
- 207 Police Juries Boost Small Watershed Activity**  
In three Louisiana parishes  
*By J. B. Earle*
- 209 Animal-Unit Leases Help Balance Grazing**  
*By Edgar Baumann and Bud Lemmons*
- 211 Scouts Serve Community, Earn Badges**
- 213 Natural Beauty and Conservation**  
Quotations from *Lyndon B. Johnson* and *Orville L. Freeman*
- 214 Review**  
Planning Our Town; Handbook of Applied Hydrology; New Publications
- 215 From the Administrator**  
Land Treatment; What Districts Do
- 216 Multipurpose Reservoir and Land Treatment**

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

Editor  
BEN O. OSBORN

Editorial Assistant  
GEORGIE A. KELLER

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Photos available on request.

**Commercial names:** Mention of commercial enterprises or brand names does not constitute endorsement by the Department of Agriculture.

**Subscriptions:** \$1.75 per year, \$2.50 foreign. Single copy, 15 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.



**T**HE success of any small watershed project depends on land treatment and land use adjustments.

These measures are the first to be considered in developing a watershed plan. In effect, they form the foundation of the watershed project, for it is on the uplands that the watershed problems originate.

Too often enthusiastic supporters think of a watershed project as a group of structures spread out across the landscape. These small dams have an extremely important function in the overall project, but their effectiveness depends largely on the quality of upland conservation measures and land use conversions undertaken by the land owners and operators.

# Watershed Land Treatment

**Land use changes, conservation  
practices reduce cropland  
and protect reservoirs**

**By John H. Wetzel**

*Director, Watershed Planning Division, SCS, Washington, D. C.*



The traveler can tell when he is in a completed watershed project by the conservation practices covering most of the land surface. The structures (lower right) may be inconspicuous and hold little water between rains.



These practices and adjustments must be tailored to fit the needs of each specific watershed. They vary widely depending on such factors as topography, climate, soils, and the desires and objectives of the project sponsors.

Land use conversions and treatment measures are absolutely essential on watershed lands. Why? Because they reduce the cost of and protect any structures that are to be built, shift cultivated crops from sloping uplands to protected flood plains, increase acreage of grass and trees, reduce quantity of runoff, curb erosion, and lessen sediment damage.

### Cropland Reduced

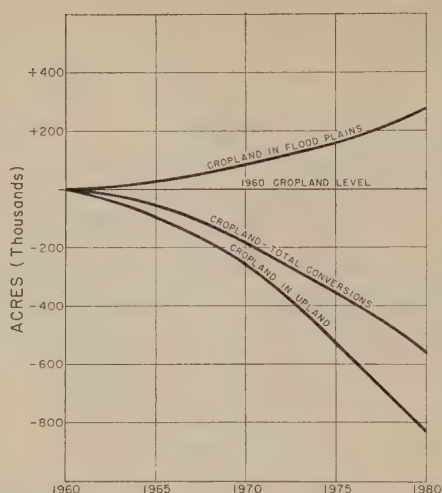
Experience has demonstrated that land use conversions tailored to meet the needs of watershed projects not only fill the soil and water conservation objectives but also result in a decrease in the amount of land in cultivated crops.

In the first 540 watershed work plans approved under Public Law 566 cropland was reduced by 168,800 acres while pasture and range land was increased by 753,300 acres.

In the six older PL-566 projects in Tennessee, cropland has been reduced by 16 percent since project installation began. Land actually planted to corn has declined 56 percent. Improved pasture has increased 43 percent and woodlands nearly 15 percent.

The Economic Research Service analysis of land use adjustments that have occurred in Arkansas' Six Mile Creek Watershed Project during the past 10 years shows that cropland has been reduced from 30,061 acres before the project to 5,970 acres in 1963—an 80 percent reduction. There has been a 61 percent increase in the grassland acreage in the watershed.

In eight representative watershed projects in Texas that cover approximately 1.75 million acres, total cropland has already been reduced from 556,000 acres be-



Estimated cropland conversions in watershed projects, 1960-80. These projections are based on conversion rates found by the Economic Research Service in a study of 540 approved projects applied to SCS estimates of number of projects in future years.

fore the project to 480,000 acres at the present time—a reduction of 14 percent. Acreage in cotton was reduced 55 percent and acreage in corn went down 75 percent. During the same period, forage crops were increased from 58,000 to nearly 97,000 acres, an increase of 68 percent.

But land use shifts are only part of the story.

The two principal factors considered in designing a watershed dam are the quantity of runoff expected under varying conditions and the amount of sediment that will be deposited in the reservoir.

### And Sediment Too

Land treatment measures substantially reduce sediment deposition and slow down the volume of runoff, thereby reducing the structure's cost and prolonging its life.

Sediment production rates for different soil and slope combinations under various types of treatment can be determined with reasonable accuracy. These rates provide design data for determining the amount of sediment that will be deposited over the life expectancy of the dam.

Sufficient storage must be included in the structure for the

anticipated sediment accumulation or the life of the structure will be seriously impaired.

Obviously the lower the sediment production rate, the smaller the space that must be "wasted" in each structure. Land treatment measures on the watershed acreage are the only way to decrease or control sediment production rates.

In addition to robbing capacity in reservoirs, sediment also is one of the major causes of pollution in our streams. Millions of dollars are spent each year in the Nation to remove sediment from municipal and industrial water supplies.

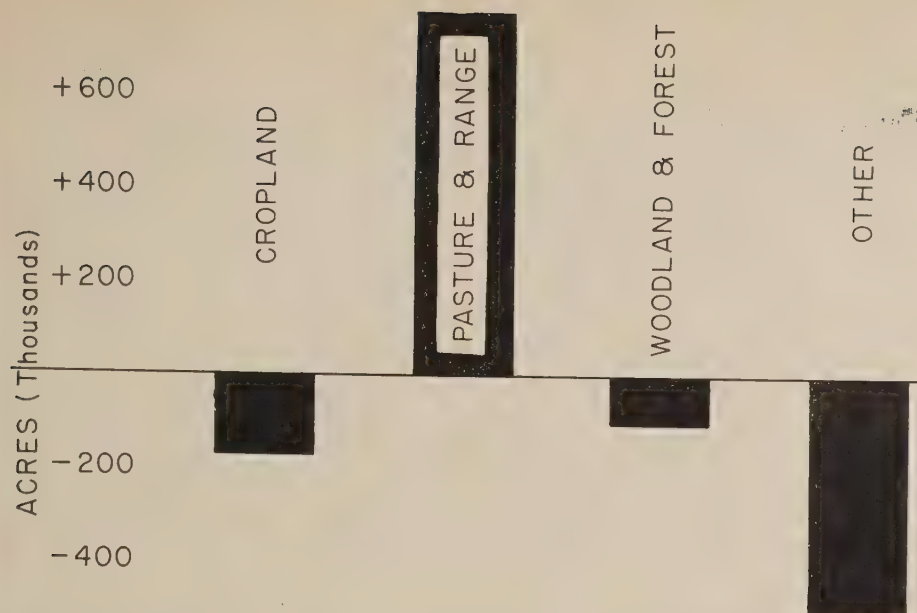
Documentation of the effectiveness of land treatment in controlling sediment production is voluminous. A recent survey on the Loch Raven Reservoir, a water supply source for Baltimore, Md., showed that the annual rate of sediment accumulation per square mile of drainage before 1943 was 0.618 acre-foot. With the installation and maintenance of a comprehensive land treatment program, this annual rate was reduced to 0.187 acre-foot for the period 1943-61—almost a 70 percent reduction.

### Effect on Runoff

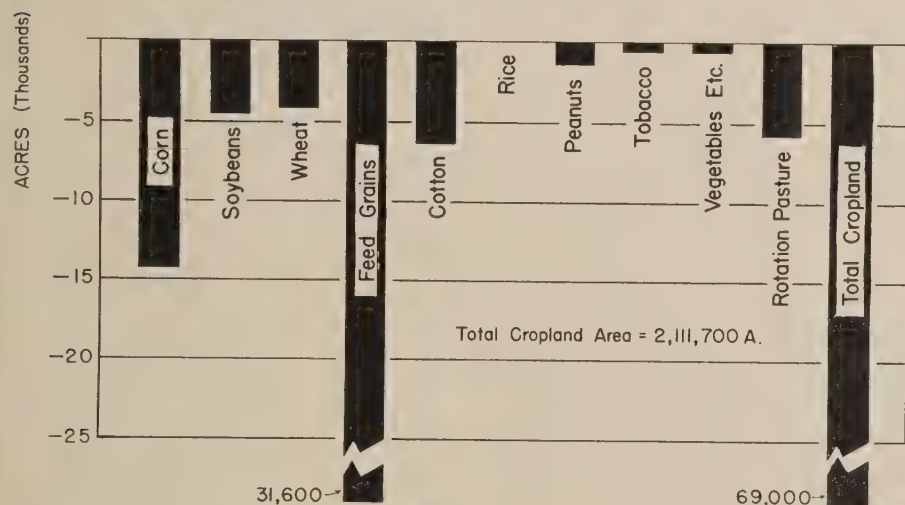
Land treatment practices also reduce the rate of runoff, but their effectiveness varies a great deal with the moisture content of the soil at the time the rain falls and the condition of the soil—whether frozen, compacted, freshly plowed, or what. Therefore, the watershed structures must be designed to meet the more unfavorable conditions anticipated in the watershed.

Although all land treatment measures in watershed projects are designed primarily for soil and water conservation, the additional benefits to both the community and the landowner are numerous. The sweeping curves of stripcropping and terraces, the lush green of rich pastures and growing trees all fit into our Nation's effort to beautify rural America.





ABOVE: Estimated changes in land use in 540 approved small watershed projects. BELOW: Planned changes in use of cropland in 112 small watershed project work plans completed since September 15, 1963.



Vegetative measures necessary in meeting the objectives of the watershed project are almost as important in improving wildlife habitat.

When land treatment measures are carefully planned and coordinated with the fish and wildlife provisions under Public Law 566, the combination can greatly improve conditions for wildlife. The same opportunity exists for coordinating income-producing recreation land treatment measures with a public recreation development installed as a part of the watershed project.

### Landowners' Contribution

Under the cost-sharing arrangements in watershed projects, landowners are expected to install the most needed land treatment measures at their own expense, except for the financial assistance available under the Agricultural Conservation Program. This is the landowners' contribution to the project. It is substantial and extremely important. Structural measures cannot be fully effective unless these soil and water conservation measures are applied on the individual farms and ranches.

For this reason one-half of the land above floodwater-retarding dams must be under basic conservation plans before the structures will be built. On seriously erosion-prone areas, 75 percent of the measures must be installed before construction begins.

Since the foundation of any watershed project is in the hands of the local land owners and operators, they alone can make it a success. The local sponsoring organizations and urban residents, when involved, should recognize the substantial contribution the watershed landowners are making and give them full credit. ♦

## A Pond Is a Place Of Many Delights

DUFFIN'S pond in Vermilion County, Ill., is a delight to many people for many reasons.

The owners, Russ and Jack Duffin, enjoy it as an outdoor laboratory for nature study in addition to its main purpose as a source of water for their livestock.

Mrs. Duffin conducts her merit badge counselor work with Girl Scouts in the area.

Local school teachers, Audubon Society members, scouts, and school children are attracted to the place by the many species of trees, birds, insects, and plants in the area. In addition to an adjacent picnic area, the pond provides excellent fishing and swimming in the summer.

The Duffins are cooperators of the Vermilion County Soil and Water Conservation District, which has used the pond as a conservation demonstration area for school teachers.

The pond was designed and its construction was supervised by the Soil Conservation Service. Seaside creeping bent grass was seeded on the pond margins.—GEORGE KINDER, *Soil Conservationist, SCS, Danville, Ill.* ♦



# Teamwork at Holly Springs

**Watershed project in national forest  
creates varied recreation fare**

**By W. L. Heard**

*State Conservationist, SCS, Jackson, Miss.*

**T**HOUSANDS of Mississippians enjoy boating, fishing, and other water-based sports in the numerous small watershed projects in the State.

Thousands of Mississippians also enjoy camping, picnicking, and hunting in national forests.

Now these two primary attractions of outdoor recreation—water and trees—are teaming up in the Holly Springs National Forest.

## **Multipurpose Reservoir**

Chewalla Lake is the first reservoir in the Southeastern United States to be developed for multiple purposes on national forest land, according to the Forest Service.

This 259-acre lake will be 8 miles east of Holly Springs, in a 984-acre tract which the Forest

Service has dedicated to recreation. A million people live within 50 miles of the lake. J. C. Franson, forest supervisor, estimates the area should attract 100,000 visitors a year and put a quarter million dollars into circulation through camping, hunting, and other activities.

Congressman Jamie Whitten, touring the site recently, said the "value of these recreational lakes is just unbelievable."

Local people have taken an active part in the project. Harris Gholson, president of the Holly Springs Bank; A. T. Gunter, Belden, chairman of the Tallahatchie Soil Conservation District, which is sponsoring the project; Marshall Clifton, Potts Camp, chairman of the Tippah River Drainage District; members of the State Legis-

lature in Marshall, Union, and Tippah counties; and many others have promoted the development.

The Marshall County Board of Supervisors acquired and donated about 88 acres of adjoining land and is working on access roads into the area.

Like most reservoirs in the small watershed program, administered by the Soil Conservation Service, Chewalla has been designed primarily for flood prevention. The lake, a structure in the lower Tippah River Subwatershed Project, will control floodwaters from 18,500 acres, and a quarter million dollars is available for its flood prevention features. The contract for the dam will be let this spring, and work should be completed in two construction seasons.

## **Forest Service Helps**

SCS engineers designed the structure and helped with the watershed treatment plan. The Forest Service will spend about a quarter million dollars, as funds become available, in construction of roads, sanitation facilities, campsites, boat ramps, and the like. In addition, they have put up \$50,000 to add recreational facilities to the lake.

The Yazoo-Little Tallahatchie flood prevention project extending across 19 northern Mississippi counties, has changed much of this country from raw gullies to green pastures, lakes, and towering trees.

The Holly Springs National Forest is no exception. Here some 200,000 pine trees, planted over the years as part of the erosion control measures in the project, add to the beauty and productive capacity of the forest.

Large dogwoods add extra color to these woods in the spring and giant cypress trees soak their feet in the swamp. Deer, drawn to forage and shelter, have concentrated here in one of the highest populations in the State. The Mississippi Game and Fish Commission, which manages hunting and fishing in



Recreation plan for Holly Springs is reviewed at the site by (l. to r.) J. C. Totten, Marshall County Board of Supervisors; A. T. Gunter, chairman, Tallahatchie River SCD; J. E. Franson, Forest Service; Congressman Jamie Whitten; the author; and Harris Gholson, president, Holly Springs Bank.



the area, annually records a high kill.

The Forest Service will continue to manage wildlife habitat for maximum populations of deer, turkey, and quail. An ancient Indian mound on the west side of the lake will be a featured attraction. Here the Forest Service plans an information center for tourists.

## More Water, More Business

### *Virginia's largest watershed project paves way for community growth*

**K**EYSVILLE, Va., is literally "priming its pumps" to start a wave of prosperity rolling across the community. The pumps, part of a new \$315,000 municipal water supply system, can deliver up to a million gallons daily to Keysville. Thus ends a water shortage that restricted expansion in recent years.

The water source, a new 45-acre reservoir, was formed by one of 17 floodwater dams being built as part of the 141,900-acre Roanoke Creek Watershed Project. Two other reservoirs will provide added multiple-use benefits to watershed residents in this largest Public Law 566 project under construction in Virginia.

#### **Immediate Benefit**

"Our new water supply has one immediate benefit," says Keysville Mayor Howard H. Harmer, Jr. "The local textile plant, Crown Colony Chenille Company, has stepped up production by 25 percent. This means more jobs for our town. Other industries, attracted by our new water resource, are considering Keysville as the likely site for their new plants."

Keysville has been getting by on an average of 200,000 gallons of water a day. The textile plant, opened 16 years ago, had expand-

The Mississippi Forestry Commission will assist with fire control in areas adjoining the national forest.

All the agencies involved—and just about everybody in the area—are working together on this recreational development, to bring pleasure and profit to Holly Springs and nearby communities. ♦

ed to a 250-job, three-shift operation with water demands growing each year. But, reaching the limit of water supplies, operations had been restricted.

"Two years ago we had to close shop 2 days a week for 6 weeks to conserve water in a prolonged dry spell," recalls J. Creighton Riepe, Jr., treasurer of the firm.

Now, with the lid off water lim-

itations, the plant managers are planning further expansion as business grows.

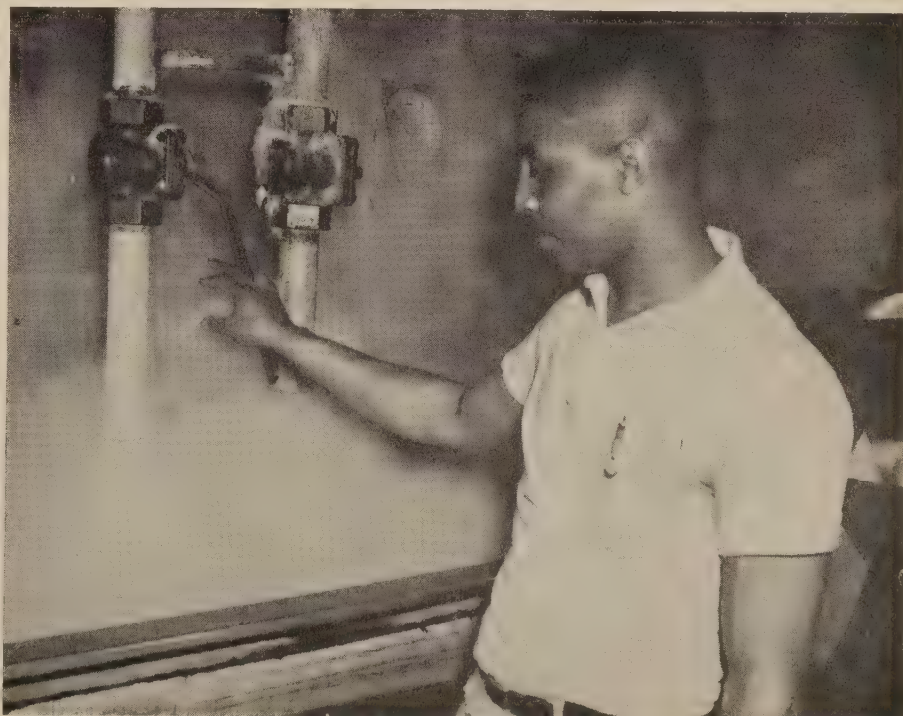
Two powerful electric pumps now supplement a series of old wells in Keysville. They siphon 700 gallons of water a minute from the reservoirs, sending it 6,000 feet to a new filtering plant on the edge of town. From there the water flows into the older system and on to the 600,000-gallon storage tank.

Costs of installing the new water system and enlarging the dam to provide municipal water were financed by a local bond issue.

The reservoir and surrounding land are being maintained by Keysville, with steps to improve the area already underway. More than 50 acres of open land has been protected by loblolly pines. A large town recreation area at the lake is the ultimate goal.

#### **How It Started**

The break in Keysville's water shortage came with a proposal for a watershed project by the Southside Soil Conservation District. William F. Vaughan, chairman of



Harry Hartso uses tons of water every day in his dye-process job at the chenille plant in Keysville. The plant uses 130,000 gallons a day.



the district and lifetime Keysville farmer, was acquainted with the water problem from both the town and rural angles.

"While Keysville and nearby Drake's Branch were short on water, we farmers were being flooded out of our valuable bottomland acres," Mr. Vaughan said. "We needed to store our water upstream to prevent floods and give the towns the water they required."

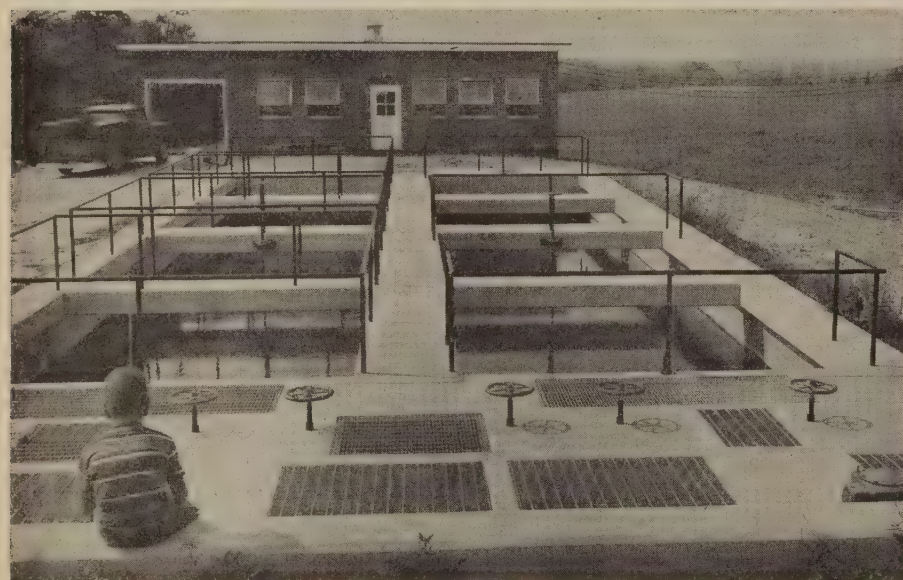
Roanoke Creek's dual water problem was well suited for cost-sharing aid offered under the small

watershed program. With local sponsorship from the conservation district and from Charlotte County, Keysville, and Drake's Branch, the project took shape on the land. SCS specialists provided the necessary technical planning assistance, and Public Law 566 funds covered structural improvement costs. Local folks handled easements, contracting, and the all-important upland conservation measures.

Roanoke Creek's flood problem centered around 6,000 acres of rich bottomland, explains SCS Civil



Drake's Mayor John S. Locke (l.) and ex-mayor W. T. Blanks, councilman, discuss long-range plans for making use of the town's new water supply created by the reservoir.



Fifty-four miles of channel improvement work in the project holds runoff from a heavy rain safely within the creek banks. Settling basins at the Keysville plant process water drawn from the reservoirs.

Engineer Samuel D. Cole, Jr. Pre-Civil War plantation owners had made good use of these fields with slave labor to dig and maintain drainage ditches and stream channels.

But post-war labor shortages and erosion from the uplands changed this. Over the years both ditches and channels filled, sending high water over valuable crops. Farmers gradually moved to higher ground.

This led to other complications. Upland soils were prone to serious erosion when plowed. Gullies gouged the rolling hills, dumping added tons of topsoil in already clogged tributaries of Roanoke Creek. Farms deteriorated and their owners moved on, leaving their idle acres to add to the growing siltation problem.

Drake's Branch, known then as "the world's largest dark-tobacco market," was the one town in the watershed located in the flood plain. The rampaging Twittys Creek, a Roanoke Creek tributary, overran the town more often with each passing year, leaving heavy damages and deep deposits of mud in the business center. One flood,



in 1940, did \$30,000 in damage. It sent several businesses looking for safer communities. The town was saved from complete economic disaster when Burlington Worcester Mills built a new plant on high ground near town, where 650 people are now employed.

"We had the water problem from both ends," says John S. Locke, mayor of Drake's Branch. "The flood problem was compounded by a water shortage during summer dry spells. We've had to ration water four or five times in recent years. But both problems will end as soon as our new dam is built on Twittys Creek just above town."

Mr. Locke refers to the second of the two watershed dams to serve the dual municipal water-flood prevention use. Because of ideal land formations their reservoir will cover 90 acres and provide an almost unlimited supply of water to Drake's Branch. At a cost of \$25,000, the town will have water for any possible expansion and an ideal recreation area for future development.

### Project Half Done

Today, the Roanoke Creek project is about 50 percent completed, Engineer Cole reports. Twenty miles of once-debris-filled channels, part of the 54 miles scheduled for improvement, have been reopened. The Virginia State Highway Department is vegetating 95 miles of eroding roadbanks to end that source of siltation. One reservoir, the third multipurpose structure in the project, provides irrigation water to the farm owner.

Ten of the planned 17 flood-retarding dams are now in place. The remaining 7 will take shape in the next few years. Together, they will be capable of blocking up to 6 billion gallons of potential floodwater to reduce flooding to a safe minimum.

In upland areas, landowners continue to add conservation meas-

ures to their fields and forests in an all-out effort to control erosion. Accelerating the work SCS and the Virginia Division of Forestry have provided added technical aid with the cost-sharing assistance of the Agricultural Stabilization and Conservation Service. Stripcropping; woodland management; pasture and grassland development; and pond, diversion, and terrace construction are healing old gullies, preventing erosion, and improving farms in the watershed.

The project, covering more than half of Charlotte County, will cost \$2,306,335; watershed funds will cover \$1,528,532 of the total. SCS economists predict a return of \$1.40 for each dollar invested.

## Pines Like Money in Bank For Banker-Farmer

"MY PINES are like money in the bank."

This is a banker, farmer, and conservationist speaking. He is S. B. Huff of Greenville County, S.C. He helped organize the Farmers Bank of Simpsonville in 1914 and the Greenville County Soil Conservation District in 1940. He has served as a member of the board of directors of both institutions ever since.

Pines have played an important part in the progress of the 300-acre Huff farm in the Fork Shoals Road Community since 1929 when one of Huff's sons came home from a high school vocational agriculture class and said he could get 1,000 loblolly pine seedlings from a State nursery if he had a place to set them out.

"I didn't think much of the idea at first," Huff said, "I'd been used to scrub pines and I didn't think loblollies would grow—but we planted those seedlings. I realize now I made a good decision."

He's been planting loblolly and slash at the ratio of about two-

Already reaping benefits from the project, the 8,000 Roanoke Creek watershed residents will gain even more in the next few years. With adequate water for future expansion, Keysville and Drake's Branch have a bright future. New industry and population gains will pump added dollars into the local economy. Farmers will have better farms and improved markets. Recreation enterprises, summer cottages, and year-round homes can be developed next to the new reservoirs.

Surrounding communities in and near the project will soon feel beneficial side effects as Roanoke Creek's new water resource pumps prosperity into the area. ♦

thirds loblolly and one-third slash. Pines now cover about one-half of his farm. By using the woodland management practices recommended by the South Carolina State Forestry Commission and the Soil Conservation Service, Huff says he has been able to get a cash income from his crop of trees and yet maintain a good stand of timber for future use.

### Drawing Dividends

"It's like drawing dividends and keeping your principal intact," he said.

Recently Huff had 30 acres of pines marked and thinned out. He got more than 120,000 board feet of saw timber that brought \$35 a thousand on the stump from that tract.

SCS Conservationist H. Granade, Greenville County, helped Huff prepare a conservation farm plan in 1936 and revise it twice since then. Huff said knowledge of the soils on his farm and their capabilities has made it possible to get the best use from each acre.



At one time he planted 80 acres of cotton plus corn and other row crops. Six tenant families lived on the place. Now he has only 8 acres of cotton planted by the one remaining tenant. As many other farmers in the South, Huff realized the value of switching from row crops to timber, grass, and cattle. Some 50 to 60 head of white-faced Herefords graze fescue grass in improved pastures and dallisgrass in the bottoms.

### A Watershed Project

Granade said Huff was the driving force behind the Huff Creek Watershed Project. The project, covering 21,000 acres, was put into operation in 1960. Three dams have been completed and two remaining dams are contracted to be built in 1965. One of these will be on the Huff farm and will protect some of his bottom land from flooding.

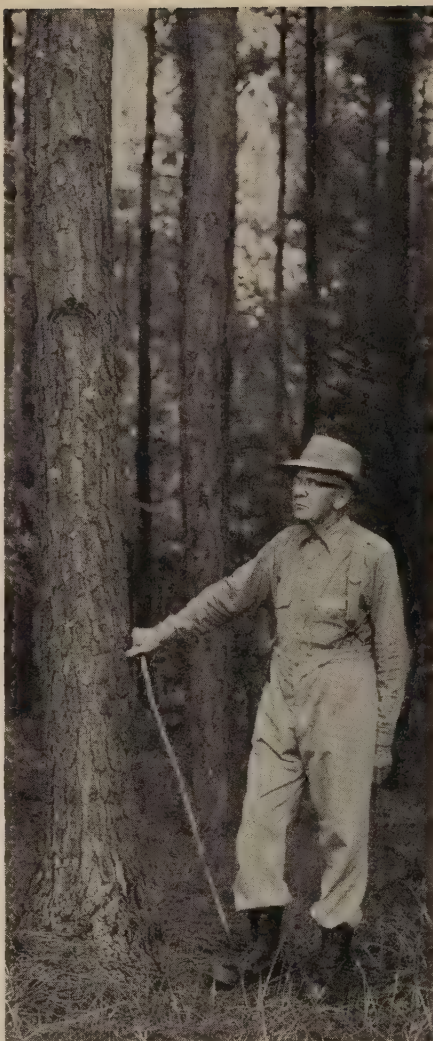
Although 82 years old, Huff sets a fast pace. He operates a tractor, rides a horse, or walks across pastures and through woods. Often he dashes off in his car or pickup truck to attend a bank directors' meeting or sessions of the soil conservation district as a supervisor, the Blue Ridge Production Credit Association as vice president, or the Huff Creek Watershed District.

Huff was the 23d farmer in South Carolina to be recognized as a "tree farmer" by the American Forest Products Industries. For many years he served on a committee to help select other "tree farmers" in the State. He's proud of the forest fire prevention work that's been done in the county.

### Fire Control

"Our county was one of the first in the State to pass a law that required a landowner to get a permit from a forest ranger before burning," he said. "We've had a fire tower for 30 years."

Mr. and Mrs. Huff live in a house built by his great grand-



Thirty-year-old pines provide S. B. Huff with a good cash income.

father, John Moon Cureton, in 1820 when the farm was part of a big plantation.

"Sherman's army camped on the plantation during the Civil War, and some of his soldiers stood on the portico and shot chickens off the roof of the smokehouse," Huff said.

Both of the Huff sons are graduates of Clemson University—James Roscoe now is an SCS hydrologist in Georgia, Patrick D. an engineer with Duke Power Co. in Charlotte, N.C.

Huff believes woodland is a renewable natural resource. He has put this valuable resource to work on his farm. ♦

## Never Summer Ranch Is Favorite Summering Spot

DESPITE its name, the Never Summer Ranch—located in north-central Colorado in the shadow of the majestic mountain range of the same name—has been a favorite summering spot for vacationers for nearly a half century.

The ranch offers horseback riding, hiking, and trout fishing in leaping mountain streams, and some of the most spectacular mountain scenery on the continent.

Operators of the ranch over the years have been the Holzwarths—John G. II, Mrs. Holzwarth, and their son, John III.

In June 1957, the Middle Park Soil Conservation District was formed and the Holzwarths became active cooperators in the district's program. John III is serving as a member of the district's board of supervisors, although when there is a meeting he must drive 100 miles round trip to Kremmling.

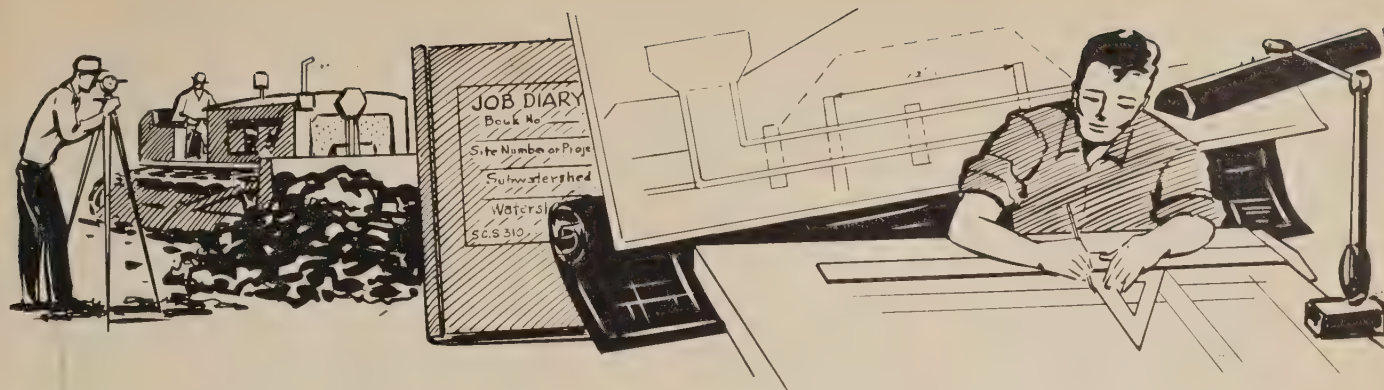
Until recent years the guest traffic demanded only a modest string of horses. Then, as business grew, the Holzwarths added to the number until they were carrying an average of 50 horses through the winter. They were renting 15 to 20 additional mounts for the summer riding months.

Keeping these horses meant a huge winter feed bill in addition to the cost of hay for the summer.

With the help of SCS, the Holzwarths developed a conservation plan to revise their irrigation system in the Colorado River's North Fork and provide better pasture and hay.

In addition to their guest ranch operation, the Holzwarths are developing a private campground. Thirty-five camping units are planned. Layout is so that additional units, up to 100, can be added.—ROBERT W. WOODS, *Work Unit Conservationist, SCS, Kremmling, Colo.* ♦





## Behind the Scenes

### On a Watershed Construction Job

By Paul E. Nylander

Construction Engineer, SCS, Washington, D.C.

AS you drive along the highway and view the things man has made, do you find yourself wondering what might have gone on behind the scenes during their construction? What their purpose might be? For whom and by whom they were constructed?

One of the structures we see more of each passing year, all across the country, is the floodwater-retarding or multiple-purpose dam constructed under Public Law 566. These dams, located in the upper watersheds, are designed to store flood runoff temporarily and release it at a safe rate. They are constructed by the local people

with Federal assistance provided through Soil Conservation Service.

To gain an insight into the construction of one of these projects let's leaf through the diary of the SCS construction engineer on the job and ponder some of the entries.

#### Millcreek Watershed Site No. 4

4/8/63. Contract awarded Bloom Construction Company.

This statement sounds simple enough. Yet before it could occur, many weeks were spent in making surveys, studying the geology, testing the soil materials, obtaining rights-of-way, making the structural designs, preparing the con-

struction drawings and specifications, and executing contractual documents.

4/12. Mr. Bean, State administrative officer, advised by phone that he and Mr. Noble, State engineer, would meet me, Mr. Arandt, contracting officer for Banner County Commissioners, and Mr. Bloom, contractor, at the County Commissioner's office at 10 a.m., April 14, to go over the plans and specifications together; and to discuss the contract and the responsibilities of the parties involved in the construction at site No. 4.

Experience has proved the absolute necessity of teamwork. The local people desire this project and have been motivated to work with the Soil Conservation Service to prepare for it. Now a third party must be included in that team. If the work is to go well, he must join the team not only with his construction forces but also with his personal support and supervision.

4/14. The contractor submitted his proposed schedule of work for our review and approval. He wants to begin clearing and grubbing the first of next week. I advised we would have the site rough staked by then.

Planning, scheduling, coordinating—essential elements to good construction. Were they well carried out on this job?







4/15. Rough staked the embankment and spillway areas and the borrow areas for clearing and grubbing. Will slope stake and x-section embankment and borrow areas as soon as clearing and grubbing are complete. It appears the ROW (right-of-way) obtained by the local people provides sufficient room for work area and disposal of waste as well as the structure and borrow. Access routes are clear and ample.

4/28. Baker and Grumann running sieve analysis on drain fill sample submitted by contractor for foundation drains.

5/3. Inspected excavations as made to determine the limits necessary. Approximately  $\frac{1}{2}$  foot of topsoil removed from foundation and borrow areas. Lower limit of the foundation drain approximately 18 inches deeper than estimated in the design to reach the pervious material underlying the valley floor. Greater depth due to drain location being moved approximately 30 feet downstream from the drill logs used in planning. Core trench excavation essentially as planned—see cross-section. Was able to place all excavated material in upstream toe of embankment as it was removed, so will be paid for only as embankment.

Grumann and Baker have been running Proctor curves on borrow material. We have the quantities and the characteristics as shown on the plan es-

entially pinned down. The CL (nonplastic clay) materials for the core as represented by sample No. 103, pit No. 3, are giving about 2 pounds more per cubic foot at about 1 percent less moisture than the laboratory sample. In all, our study shows the geologic investigation and sampling were very well done.

The 4-foot coffer dam the contractor built upstream from the site appears adequate to hold back the small streamflow now coming down the valley. Except for a slight seepage the core trench is dry and the accumulation can be quickly removed before backfilling.

Measuring, testing, inspecting—like preparing meals and washing dishes they tend to become a monotonous routine. Yet the quality of the structure would not be assured without them. Standard specifications have been prepared for

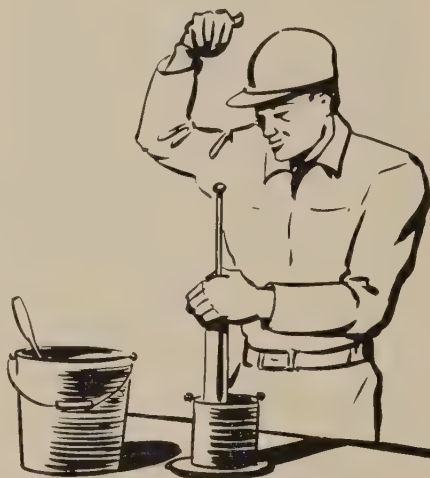


each item of work. Certain requirements were known by the design engineer to be necessary to perform individual functions. Here they are being transferred from a concept to a reality and there must be no mistake in the process.

5/12. Advised Mr. Bloom the payment lines are the neat (exact) lines of the specified cross-section.

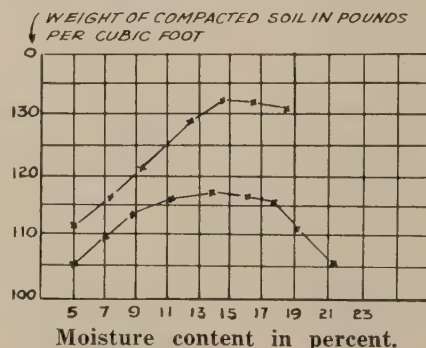
We knew there would be a reference to money somewhere. On second thought, in spite of taxes and troubles, this is an improvement which will add much to the safety and enjoyment of the community. There probably will be an opportunity for recreation in the form of fishing, hunting, or water sports. Perhaps there is enough additional water stored for irrigation, municipal, or industrial use. Good things aren't free nor would we value them if they were.

5/20. Concrete pipe arrived today. Mr. Arandt called to say he had received the certification that the pipe was manufactured according to the specification. Contractor placed eight lengths. Went together smoothly. Paid particular attention to joints and elevations. Had only one rubber gasket displace, so removed the section and relaid, straightening out the gasket. The steel rings go together well



Soil compaction test.

#### PROCTOR CURVE





when the gasket and ring are well lubricated with vegetable soap and the sections alined carefully. Contractor hopes to place concrete in the cradle, cutoffs, and pipe support late tomorrow p.m.

Materials must be selected carefully if they are to fulfill their purpose for a hundred years. Buried as they are under many hundred tons of earth they will be subjected to very great stress. To have to replace them because of deterioration or improper construction would be costly as well as interrupting the protection and purpose of the structure.



Crushing of concrete sample.

5/21. Completed placing pipe at noon. Inspected forms and steel in base of riser pipe cradle, cutoffs, and pipe support at 3 p.m. Contractor has elected to use class B concrete in the cradle also rather than to furnish two classes. Concrete began arriving at 3:30 p.m. and job completed at 5:30 p.m. Slump test



Concrete slump test.

on first load was just under 3 inches and entrained air 5½ percent. Baker made cylinders from first load and from the last. Load No. 1 was placed in upper two sections of cradle, load No. 4 in lower two sections. Exposed surfaces will be cured with covering of burlap kept wet by seep hose. Contractor had short tremie to place concrete in pipe support. This support extends approximately 10 feet below the invert of the pipe. Weather forecast is for a low of 45° F. tonight so no heat will be necessary to protect the green concrete unless lower temperatures are reached. Contractor is leaving a watchman on duty to notify him if heat is required.

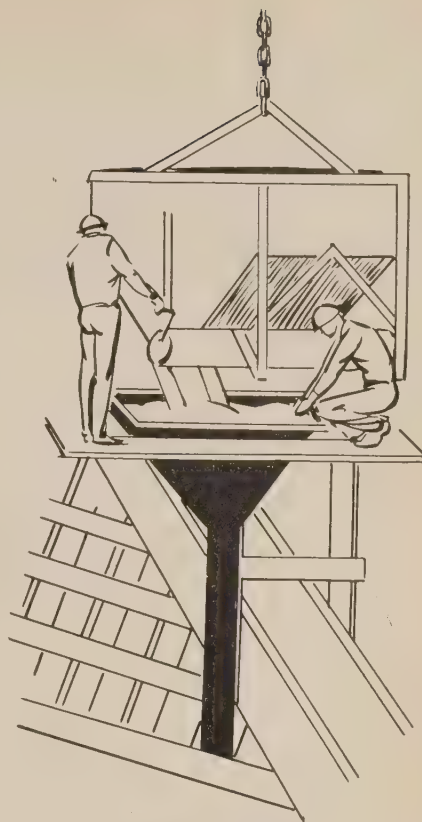
I wonder if the contractor was aware of the multitude and exactness of the requirements of this job when he bid on it. Certainly he must have needed great determination to meet them all under the conditions of weather and of the site that normally exist.

5/22. Checked the maximum-minimum thermometer the first thing this morning. Low 47° last night.

5/29. Contractor expects to place concrete in riser tomorrow. Inspected reinforcing steel forms and fastenings for slide gate and gate well in p.m. One Mark 3 No. 6 bar had to be added just over the pipe in the riser. Advised contractor it would be wise to have a spare concrete vibrator to be sure that if his broke down he wouldn't have to stop placing concrete. Seven-day cylinders on cradle and diaphragms show ample strength to put in service. Backfill will be started tomorrow.

Railroads and airlines aren't the only ones that require safety features and standby equipment.

5/31. Forms stripped from riser. Slight honeycombing below port repaired. Form tie holes filled and structure coated



Pouring concrete through a tremie.

with curing compound. Observed this application, placed in two coats, different directions. Good coverage.

Contractor continued placing embankment materials. Began crossing over pipe with heavy equipment from 30 feet above the centerline of dam to downstream slope. Hand placed backfill in excess of 2.0 feet over all concrete or concrete pipe. One moisture density test of backfill satisfactory, two tests of embankment. Density Test No. 34 of zone No. 1 material 92 percent of specified density. Will run another first thing in morning for check. May have to rework the first foot.

6/1. Worked with Contracting Officer Mr. Arandt on quantities and forms 49a and 49b for monthly pay estimate.

Check test on moisture density of fill placed in zone No. 1 approximate elevation 21.7, 90.7 percent, 23.7 percent moisture. Contractor elected to rip





up the last lift and recompact. Drying obtained by reworking should bring moisture content down so that specified density will be obtained. 4 p.m., moisture density test of reworked material shows 96.7 percent standard Proctor so contractor began new lift.

H'mm! There were some problems!

6/6. Word received on 7-day break of concrete test cylinder for riser at 3,170 psi (pounds per square inch). Contractor may begin backfill around riser tomorrow.

Step by step the work progresses.

6/8. Took final x-sections of channel and scourhole excavation station 3+47 to 7+85.



Grading and packing.

Contractor has finished this area very well. Material in scourhole quite cemented so would not have developed by action of water alone without considerable lateral scour.

6/22. Material in inlet of emergency spillway became extremely hard. Contractor requested rock classification station 0+50 to 1+35, approximate elevation 30.0 and 34.0 respectively. Since it is a borderline decision he will mount ripper on test tractor this p.m. in order that we can test ripability for classification of this area tomorrow. Ripper he has been using has been on larger tractor.

Decisions, decisions. There must have been many of them before this job was completed.

6/23. Material tested for ripability classified as rock. Test equipment could not remove it. Took cross-sections of surface as exposed. Will add to the survey as rock is uncovered if larger area is involved. Called State Conservation Engineer Mr. Noble to advise of classification of excavation and to discuss use of coarser material. He agrees the difference is too slight to require any change.

Consultation is the thing. Be sure there's agreement among those responsible. This teamwork seems both admirable and effective—and certainly much more pleasant.

6/24. Rain beginning about 3 a.m. Advised contractor at 8 a.m. I would ask contracting officer to issue stop order as of that time. Too wet to operate equipment or to place fill.

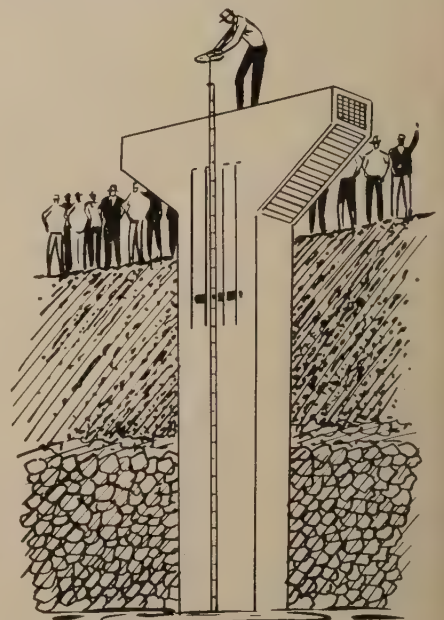
6/27. Contracting officer issued start order as of 8 a.m. They've even made provision in the contract to stop for bad weather. This should make the contractor's costs more predictable.

6/30. State Conservation Engineer Mr. Noble on job for semifinal inspection. Noted broken earthscraper at edge of borrow pit No. 2, also some large

boulders on the edge of the woods about the same location. The latter had come from the borrow area and will have to be buried there. The scraper must be moved. Riprap along approach to emergency spillway too coarse to blend into contour of side slope. Will have to be reduced in size and shaped up. Some cleared material and a fringe of borrow stippings right side, upper end of sediment pool must be cleaned up. In general Mr. Noble believed the finish was very good.

Contractor will begin fencing tomorrow and seeding and mulching Monday. Expects to be finished with all phases Wednesday, July 12. Have notified contracting officer and State administrative officer. Expect to set up final inspection for Friday, July 14.

Well! It's good to have that job completed. Without reviewing this diary we'd have no concept of the many steps, the various items, the myriad of decisions, and the willingness to work together that were required. It couldn't have been accomplished by any one of the three parties working singly, but together they made it a work of which they can be proud. ♦



Drain closed as symbol of acceptance.





Alton Mangum (r.), SCS assistant State conservationist, discusses plans for the Bayou Rapides Watershed Project at a regular meeting of the Rapides Parish Police Jury.

## In Three Louisiana Parishes ... Police Juries Boost Small Watershed Activity

By J. B. Earle

State Conservationist, SCS, Alexandria, La.

**G**OVERNING bodies of three Louisiana parishes (counties) have joined with other public and private groups to promote small watershed projects in their areas.

Voters of Rapides, Evangeline, and Tensas parishes have given the parish police juries authority to levy taxes, exercise the right of eminent domain, and contract for, operate, and maintain watershed projects.

### Sound Planning

This widespread authority permits sound planning of all phases

of watershed projects. The experience of the three parishes underlines the value of cooperation between local government leadership and soil conservation districts.

The people of Rapides Parish voted a 4-mill tax levy, to run for 10 years, to develop the Bayou Rapides and Bayou Boeuf watersheds. Work is underway on the

Cotile Reservoir in Bayou Rapides. The reservoir will contain 25,000 acre-feet of water storage for irrigation and recreation.

Planning is nearly complete on the Bayou Boeuf Watershed Project, which will contain two similar multipurpose reservoirs on Valentine and Indian creeks. These lakes will provide irrigation water for nearly 40,000 acres of land. The increased value of this land is expected to more than repay the estimated \$2.5 million that the projects will cost the parish, according to Brian Duke, president of the Rapides Parish Police Jury.

### A Recreation Bonus

"And for a bonus we will have three of the finest recreation areas in the State," Duke said.

O. O. Moore (l.) of SCS explains a backfilling operation on the Cotile Reservoir of the Bayou Rapides Watershed Project to J. A. DeKeyser of the Lower West Red River SWCD and Brian Duke of the Rapides Parish Police Jury.





In adjoining Evangeline Parish the need for a parishwide effort became evident after 14 drainage districts and 79 group drainage projects failed to solve the parish's soil and water problems.

A. G. LaHaye of Evangeline Parish, a supervisor of the Grand Coteau Ridge Soil Conservation District, told about the opportunities under USDA's watershed protection and flood prevention program. Farmers were interested.

"We were interested, too," said John Andrus, president of the Police Jury. "We have seen the first proposed small watershed project in the parish wither for lack of an effective legal organization to put it through. We were willing for the parish government to be that strong arm, but we wanted all of the parish to be served and we wanted the people to make the decision without undue influence from us."

#### Local Funds

Plans were laid to develop three watershed projects to serve all of the land in the parish that needed such treatment. The voters ap-

proved a \$1 million bond issue to develop the parish's land and water resources and provide measures for flood prevention, and water management.

Major items of improvement planned are 17 flood detention dams, with 1 enlarged for recreation; about 275 miles of stream channel improvement; and many low-level dams in the channels to hold water for irrigation.

In Tensas Parish, local, State, and Federal cooperation has resulted in a sound conservation program. More than 100 miles of channel improvement is being completed in Gravity Drainage District No. 2, in the northern part of the parish, at a cost of about \$500,000. Local funds are paying half of this cost.

Landowners in Tensas Parish are expected to spend more than \$2 million for water management, land leveling, and other land treatment practices on 76,000 acres. Benefits will be an estimated \$5 for every \$1 of cost. Plans are being made for similar programs throughout Tensas Parish.

Land, water, and people in this

part of Louisiana will benefit from the increased watershed activity made possible by the cooperation of the parish police juries. ♦

### Great Plains Conservation Program

The Great Plains Conservation Program is a long-term soil and water conservation program aimed at bringing about needed land use adjustments and the application of enduring conservation practices.

In the Great Plains, an area of severe climatic hazards, various programs have been carried out in the past to meet emergency situations at a relatively high cost. The Great Plains Program is designed to bring about a more nearly permanent solution to the problem resulting from drought and the cultivation of low-grade cropland.

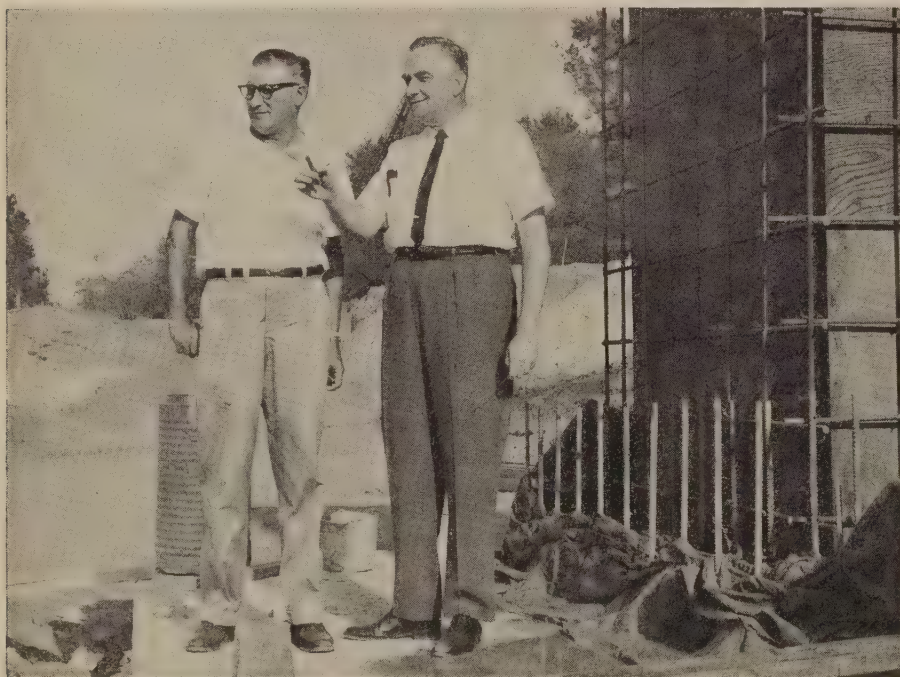
This program was recommended by the Great Plains Agricultural Council, by farm organizations, soil conservation districts, and others. Responsibility for administration is assigned to SCS. ♦

### River Basin Investigations

The Soil Conservation Service cooperates with State governments and with other Federal agencies in river basin planning, surveys, and investigation, under the provisions of Watershed Protection and Flood Prevention Act, as amended.

River basin surveys are undertaken at the request of the cooperating State or Federal agencies. They are extremely valuable in maintaining coordination between the upstream watershed aspects for which USDA has responsibility and the downstream problems of water resource use and development. ♦

One cow can drink close to 25 gallons of water a day—so stock-water ponds need to be deep and capable of providing adequate water supplies.



DeKeyzer and Duke, standing at the drawdown tube being constructed for the Cotile Reservoir, discuss progress being made at the site.





Bluebunch wheatgrass provides abundant forage on the rolling Pilot Rock range.

## Animal-Unit Leases Help Balance Grazing on Pilot Rock Range

By **Edgar Baumann** and **Bud Lemmons**

*Work Unit Conservationist, SCS, and News-Director, Georgia-Pacific Corporation, Pendleton, Oreg.*

**A** CONSERVATION plan based on per-animal range leasing has produced impressive results for the Georgia-Pacific Corporation, a major timber-lumber-plywood firm in Northwestern United States.

Working with the Southern Umatilla Soil Conservation District and the Soil Conservation Service, Georgia-Pacific has developed a conservation plan for its Pilot Rock Division in Oregon. The plan provides for seasonal inspections to determine how many cattle to pasture on a scheduled basis in designated areas, and users pay for the animal-units of grazing obtained.

Range leases formerly were made on a per-acre basis without consideration of type or amount of forage available. Range condition generally declined under that system.

### Larger Calves

Ranchers note larger gains per calf during the growing season than on similar ranges under the old system. Cattle graze on abundant forage as a result of a planned conservation program that keeps

The fence line between the Cunha Tract, to the right, and untreated range shows the effect of the conservation program.







Cattle gains have increased with the improved condition of the Pilot Rock range.

A seep in a lightly grazed part of the range is turned into a watering place by installing a 50-gallon barrel for a reservoir and piping the water to a trough.



livestock and available forage in balance.

Range in the tract is in great demand among ranchers, evidence of improving condition.

The program has been in effect on the 18,000-acre Cunha Tract of the Pilot Rock Division for 4 years. A recent range utilization check by SCS personnel with Herb Smith, forester-in-charge of Pilot Rock Division land leasing, showed that the degree of grazing is well within safe limits.

The impressive results took time, planning, and money. SCS made inventories of soils and sites to provide basic data on which Georgia-Pacific could formulate a range conservation plan that would coincide with timberland multiple-use plans.

#### For Uniform Grazing

Thus far in the program 27 miles of fencing has been installed and repaired to complete the boundary and 6 miles of cross fencing to separate seasonal ranges and allow improved grazing distribution. Ten springs have been developed to provide ample stock water for more efficient use of forage.

Stock is kept from the range until grass has good growth and the ground is dried out enough to prevent trampling. Salt is placed in

unused areas to encourage more uniform range use.

The Pilot Rock Division has planned experiments to determine whether the program has any effect on reproduction and growth of trees. Consideration also will be given to a workable plan for rotation deferred grazing.

"A conservation program such as this might seem foreign to a company primarily interested in logging and lumber manufacture," said Mr. Smith. "But Georgia-Pacific's progressive thinking, coupled with assistance of the SCS and Southern Umatilla District, has proved such conservation not only possible but successful." ♦

#### Snow Surveys and Water-Supply Forecasting

Most of the water for the Western States—for agriculture, industries, cities, power—comes from the snow that falls in the mountains.

Several times each winter more than a thousand snow surveyors measure the snowpack on some 1,400 snow-survey courses in remote, rugged mountain areas of the Western States and British Columbia. Data they collect are translated into a water-supply forecast issued by the SCS, usually about mid-April. ♦



## Scouts Serve Community, Earn Badges By Helping Install Watershed Project

AS the last of the construction equipment moved out of the Dry Creek Debris Basin near Lehi, Utah, a group of young conservationists moved in.

Boy Scouts from the nearby communities of Highland and American Fork seeded the steep borrow areas and banks of the newly constructed dam with grass and clover. They placed tree limbs and rocks as checks in the recently eroded areas and followed up with tree and shrub planting to provide erosion control and food and shelter for wildlife.

Conservation of natural resources is one subject that all Scouts must have to fulfill their advancement requirements. In providing projects for the boys to work on, the Soil Conservation Service has found a place to use

the Scouts in the American Fork-Dry Creek Watershed Project. This not only provides an opportunity for the boys to serve the community, but it also helps reduce costs and speed up construction.

During the annual spring camporee 100 boys and leaders from the Alpine Scouting District reseeded special purpose terraces at the head of Dry Canyon above Lindon. During the winter and spring months ditchbanks were seeded with sod-forming grasses. Browse and shrubs were planted in the foothills to provide soil cover and winter food for the deer and small game animals. Trees were planted on the Battle Creek Debris Basin to provide cover and beautification of the area. Trail and campsite improvement was practiced

while on hikes and overnight camps.

Some 350 boys from American Fork, Alpine, Highland, and Pleasant Grove have put in more than 900 hours of conservation work in the watershed in the past 2 or 3 years.

With the completion of the Grove Creek Debris Basin near Pleasant Grove, arrangements have been made for the Pleasant Grove and Lindon Boy Scouts to seed the steeper areas of the dam.

Scouts from Lehi and American Fork are in the process of seeding irrigation ditchbanks, and more trees will be planted in the spring.

As more problems and projects come up, the Scouts will be contacted and the watershed administrators can be assured that the work will be carried out, for these boys know that conservation done today means a better America tomorrow.—DONALD W. BELL, *Soil Conservationist, SCS, Lehi, Utah.* ♦

A group of Boy Scouts from Pleasant Grove plants trees at the Battle Creek Debris Basin site to control erosion and provide wildlife cover.





# Soil Conservation Service and Magazine Mark 30th Anniversary

Nineteen Sixty-Five marks the 30th anniversary of the Soil Conservation Service and *Soil Conservation* magazine.

On April 27, 1935, the Seventy-fourth Congress passed Public Law 46 creating the Soil Conservation Service of USDA. This act for the first time gave national recognition to the menace of soil erosion and brought into one agency the soil conservation work of USDA and the Department of the Interior.

On August 1, 1935, the Bureau of the Budget authorized the publication of *Soil Conservation* as the official organ of the Soil Conservation Service.

Here are some of the events and problems reported in the magazine 30 years ago:

Ninety-four new erosion demonstration projects were announced on August 5, with allocation by the President of \$25,500,200 of Works Relief funds. At that time there were already 40 projects in operation.

Nineteen new nurseries were established to meet the pressing demand for trees, shrubs, and grass seed for use in erosion control demonstration projects, bringing the number of nurseries to 83.

Eight of the 11 original regional offices were established throughout the country in 1935.

The employment of relief labor was a major concern of Government agencies in 1935. The magazine reported 18,433 workers transferred from relief rolls to SCS in October.

Some of the topics discussed in the magazine 30 years ago were wind and water erosion, dams, pasture contouring, terracing, erosion-control demonstrations, highway protection, machinery, grass cover, gully erosion, and gully control. The organization of SCS re-

search was played up prominently in early issues of the magazines.

Many of these same problems are still with us, but the techniques for handling them have progressed through the years. The organization of SCS has changed too. The regional offices, demonstration projects, relief labor, and

SCS research are gone.

*Soil Conservation* magazine also has gone through a metamorphosis. It started out as a 16-pager; now it has 24 pages. It has changed its appearance several times, from 2-column to 3-column format, and to more modern type and pictorial style. It has had four editors during the past 30 years: Wellington Brink from 1935-56, Tom Dale 1957-61, and Frank B. Harper 1961-64 preceded the present editor. ♦

## Farmland To Recreation and Homes

WINDSOR LAKE, north of Madison, Wis., is the center of a successful transformation of farmland to recreation and residential uses.

With the help of the Soil Conservation Service, Mel Busse, a Dane County farmer, constructed a 10-acre lake around which a subdivision of homes and an 18-hole golf course have been established.

Busse made use of a basic resource on his land—a spring—to form the lake. He used the soil map provided to him as a coopera-

tor with the Dane County Soil Conservation District in locating the land best suited for the golf course and home sites.

A neighboring farmer, Millard Erickson of DeForest, also developed a spring-fed lake on his property. Homes are going up on the lakeshore. Here, too, the SCS soil map helped plan the land use changes. Conservation measures on the land kept in farming will protect the lake from siltation.—HAROLD B. PORTER, *Work Unit Conservationist, SCS, Madison, Wis.* ♦



Crops once grew where this 18-hole golf course is laid out on the shores of Windsor Lake, Wis.



# Natural Beauty and Conservation

By Lyndon B. Johnson

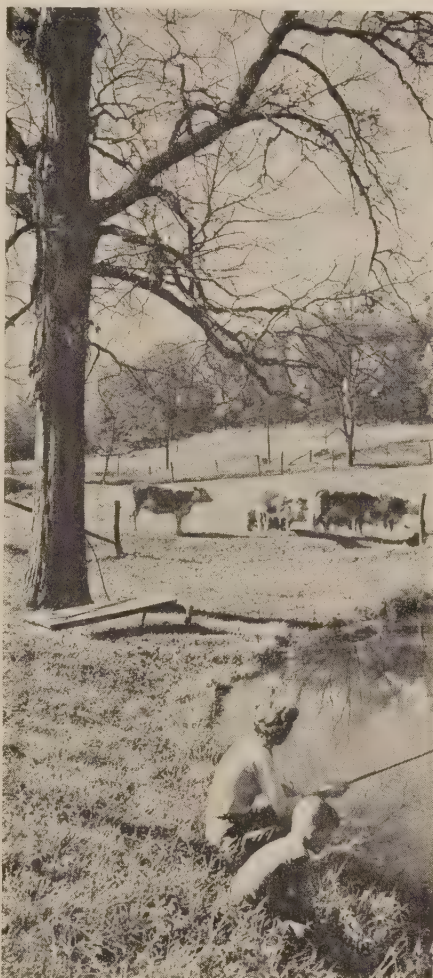
**B**EAUTY is not an easy thing to measure. It does not show up in the gross national product, in a weekly pay check, or in profit and loss statements. But these things are not ends in themselves. They are a road to satisfaction and pleasure and the good life. Beauty makes its own direct contribution to these final ends. Therefore it is one of the most important components of our true national income, not to be left out simply because statisticians cannot calculate its worth.

And some things we do know. Association with beauty can enlarge man's imagination and revive his spirit. Ugliness can demean the people who live among it. What a citizen sees every day is his America. If it is attractive it adds to the quality of his life. If it is ugly it can degrade his existence.

Beauty has other immediate values. It adds to safety whether removing direct dangers to health or making highways less monotonous and dangerous. We also know that those who live in blighted and squalid conditions are more susceptible to anxieties and mental disease.

Ugliness is costly. It can be expensive to clean a soot smeared building, or to build new areas of recreation when the old landscape could have been preserved far more cheaply.

Certainly no one would hazard a national definition of beauty. But we do know that nature is nearly always beautiful. We do, for the most part, know what is ugly. And we can introduce, into all our planning, our programs, our building, and our growth, a conscious and active concern for the values of beauty. If we do this



then we can be successful in preserving a beautiful America.

There is much the Federal Government can do, through a range of specific programs, and as a force for public education. But a beautiful America will require the effort of government at every level, of business, and of private groups. Above all it will require the concern and action of individual citizens, alert to danger, determined to improve the quality of their surroundings, resisting blight, demanding and building beauty for themselves and their children.—

*From White House Message to Congress on Natural Beauty, Feb. 8, 1965. ♦*

By Orville L. Freeman

**A**LTOGETHER the farmers and ranchers in this country control the use of soil, water, forests, and wildlife on 85 percent of our land area—and the Department works directly with them in programs to conserve, manage, and develop the use of these resources. In addition, there are some 180 million acres of National Forest and Grasslands which are administered for public use by the Department. Within the Department, vast programs of conservation research, education, technical and financial assistance, and management are functioning to protect and conserve the bulk of the Nation's soil, water, and timber resources . . . .

The work that is being done in every State provides the basis for a whole new concept of what rural America is and can be. This emerging concept is the basis for the better life that President Johnson so eloquently challenges us to reach out for in building a Great Society. In a vital and critical sense, this means the work of conservation—of making full use of the great outdoors to accomplish a more meaningful life for all our people.

No longer is it necessary for the factory, shop, or market, by the need for power, to be tied to the river waterfall, or by the need for communication and transport to be tied to the harbor or railroad. Rural electrification, rural telephone systems, and better highways and truck transport have changed that. Now it is economically feasible for America's people to both live and play where they seem to prefer—in the countryside—and to work where they want to live.

President Johnson, in describing his vision of the Great Society,



said that we must begin to build it in the city, in the countryside, and in the classroom. Through wise use—through the application of new dimensions of conservation—we can make the countryside a classroom for the people of the city to study and enjoy the great outdoors.

And, if we are successful builders and good teachers, we may create an environment where the simple truths of nature and the green beauty of open space enables us to match the meaning of our lives with the marvelous products of our labor.—*From address to Minnesota Conservation Federation, Sept. 19, 1964.*



**Planning Our Town.** BY MARTHA E. MUNZER. 1964. *Alfred A. Knopf, New York.* 180 pp., illus. \$3.95.

This book was prepared for the Conservation Foundation as an introduction to city and regional planning for young readers. It should be equally valuable to adults interested in understanding the complexities of planning.

The author uses her own home town near New York City as an example to illustrate the problems of city planning as encountered, first, in planning a new town, then in rebuilding an old one. From there she moves to the larger horizon of resource planning in relation to the total living environment, including considerations of the use, development, and conservation of water, air, living space, recreation, and transportation. These are skillfully tied into the needs back in "our town."

The book is well illustrated and includes a selected reading list and list of institutions offering studies and degrees in planning professions. The latter should be helpful

to young readers considering careers in regional or city planning.

The author is a graduate of Massachusetts Institute of Technology and taught chemistry in New York high schools before her association with the Conservation Foundation. A broad understanding of resource interrelationships is evidenced in this contribution to planning.—JOHN W. BARNARD, *Resource Development Division, SCS.*

**Handbook of Applied Hydrology.** EDITED BY VEN TE CHOW. 1964. *McGraw-Hill Book Co., New York* (1,415 pp.) illus. \$39.50.

The large body of hydrologic information and technology originated and used by the Soil Conservation Service finds its way into the technical literature available to the general practitioner by means of chapters contributed by SCS authors and former colleagues to this "compendium of water-resources technology" (subtitle).

The book consists of 29 sections by 45 authors. Pages and figures in each section are numbered in a separate series.

Two sections were written by people actively engaged in hydrology and watershed work in the Soil Conservation Service:

Sec. 17-I. "Reservoir Sedimentation," by Louis C. Gottschalk, geologist (recently retired.)

Sec. 21. "Hydrology of Agricultural Lands," by Harold O. Ogrosky, chief, Hydrology Branch, and Victor Mockus, hydraulic engineer.

Another section is the product of former SCS employees:

Sec. 12. "Infiltration," by G. W. Musgrave, retired and now a consultant in hydrology, and H. N. Holtan, hydraulic engineer, Agricultural Research Service.

In addition, technical information from the Soil Conservation Service is widely used in other sections, and publications of SCS people are cited in the references. This book incorporates some of the methodology of SCS into an or-

ganized body of information on applied hydrology.—B.O.

## New Publications

**Sedimentation of Loch Raven and Prettyboy Reservoirs, Baltimore County, Md.** BY JOHN N. HOLEMAN. 1965. *USDA SCS TP-145.* 18 pp., illus.

A well-illustrated report based on 1943 and 1961 sedimentation surveys showed that sedimentation rates in the two watersheds decreased appreciably between these dates. The principal reasons appeared to be the conversion of large acreages from agricultural to residential and other nonfarm uses and the installation of conservation measures on much of the remaining farmland. Data from both surveys indicate a decreased rate of sediment accumulation during the 1943-61 period from that in the earlier period.

The annual rate of sediment accumulation per square mile of drainage area in Loch Raven Reservoir before 1943 was 0.618 acre-foot, for 1943-61, 0.187 acre-foot. For 1933-43 the rate of sediment accumulation in Prettyboy Reservoir was 0.699 acre-foot per square mile of drainage per year; for 1943-61, 0.391 acre-foot.

The report also describes the geology and soils and the conservation measures and land use of the area.—G.A.K.

**An Engineering Career for You in the Soil Conservation Service.** Rev. 1965. *USDA Misc. Pub. 715.* 2-page fold, illus. A description of job opportunities in the fields of structural design, hydrology, hydraulics, construction irrigation, drainage, erosion control and water conservation, geology, soil mechanics, and water-supply forecasting.

**Poverty in Rural Areas of the United States.** BY ALAN R. BIRD. 1964. *USDA Agr. Econ. Rpt. 63.* 46 pp. Basic statistics for those concerned with the war on poverty.

**Skiing.** BY U. S. FOREST SERVICE. 1964. *USDA PA-525.* 16 pp. Notes on winter playgrounds in the National forests.



From the Administrator:

## Land Treatment • What Districts Do

**W**HAT IS a small watershed project? How can the average citizen, traveling across this broad land, know when he sees one?

A completed small watershed project is a combination of all the needed conservation measures applied to all the land draining into a small stream (a watershed), supported by necessary structures to regulate runoff so as to avoid destructive floods and turn the water to planned beneficial uses.

Such a watershed project plan translated from specifications on paper to realities on the land should be obvious to any passerby. Most conspicuous will be the presence of appropriate vegetation on every acre, each used in keeping with its capability—well-tended crops, lush grass, trees, and wildlife cover; the presence everywhere of needed conservation practices—terraces, strip crops, ponds, and the like; and the absence of scars of erosion and deposits of sediment.

The dams, floodways, diversions, and other structures that commonly receive most attention in the discussion of project plans may be out of sight of highways or inconspicuous in the landscape. Although they involve the major expenditure of public funds and are the physical core of a successful project, structures alone do not make the project.

Land treatment comes first. It is the basic element of watershed protection. Not only is it needed on every acre to protect soil, water, plant, and animal resources in place, but it is necessary for the successful operation and long life of the water-regulating structures in the valley.

Collectively, land treatment measures are the most evident features of an effective watershed project. They should proclaim clearly to the traveler that he has entered a treated watershed.

Unfortunately, too many of the watershed projects now considered as "completed" fall short of being such a showcase of sound land use and treatment. Under present standards, the minimum requirement is basic conservation plans on 50 percent of the land draining to a site before the structure is built.

It should be emphasized that this is a *minimum*. Our objective should be at least 75 percent of needed measures applied on an entire watershed within 5 to 10 years in most projects. The long-term goal is conservation treatment on 100 percent of the area. Only then is a watershed project *complete*.

Such projects not only will accomplish the local objectives of flood prevention and coordinated resource use but they will meet the modern conservation challenge of preserving and enhancing the natural beauty of the American landscape.

**W**HAT DISTRICTS do for America: I had occasion to summarize for soil and water conservation district officials attending the annual meeting of their national association (NACD) recently what districts do for America.

All America needs to know about the vital role of these local citizens' bodies in the life of our Nation. At this crucial time in the evolution of the conservation movement, urban people have a special interest in what districts do to preserve and improve our natural

resources and sustain our economy. Here is my list:

- Soil and water conservation district programs create new wealth in rural and urban America.

- They reduce waste and damage in the use of soil, water, and related natural resources.

- They strengthen the economic capability of rural America, and thus contribute to the health of the total national economy.

- They reduce the flood hazards and the silting of rivers, harbors, and reservoirs.

- They create additional private employment opportunities.

- They develop a wider usefulness for all of America's natural resources.

- They create a strong market for the products of industry.

- They develop new and improved water supplies for industry, agriculture, recreation, and municipalities.

- They add to the fish, game, and wildlife population.

- They promote privately owned recreational space and facilities.

- They provide an organized channel for the practical application of research and science to current resource problems.

- They encourage the improved management and marketing of farm-produced timber and wood products.

- They contribute substantially to the beauty of the countryside.

And, for the benefit of those concerned with watershed treatment and water management, I might add—

- They co-sponsor nearly all the small watershed projects in the country.

—D. A. WILLIAMS



If your address changes, please notify us of your complete new address, including Zip Code number, and include old address with our code number as shown above.

## Multipurpose Reservoir and Land Treatment Story on page 199.



This multipurpose reservoir and the conservation land treatment around it go hand in hand to provide flood prevention, community water supply, economic development, recreation areas, and a more beautiful countryside. The structure (l. r.) is on East Wards Fork, Roanoke Creek Watershed, Va. ♦



# Soil Conservation

MAY 1965  
VOL. XXX, NO. 10

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

MAY 4 1965

CURRENT SERIAL RECORDS

ACTION IN APPALACHIA—Page 221

RURAL BEAUTY—Page 227

SOIL STEWARDSHIP—Pages 219, 226, 232, 237





# Soil Conservation

## *Stewardship . . .*

Amidst springtime's surge of new life is a fitting time to be reminded that economics is not the only—or even the basic—motivation for conservation.

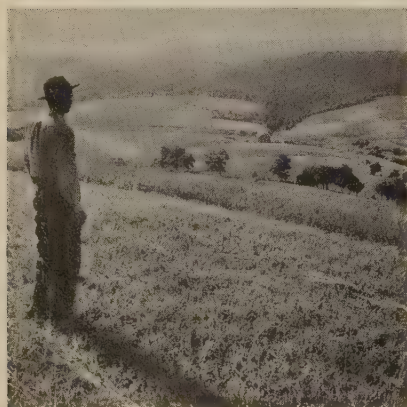
Soil Stewardship Week, sponsored annually by NACD, is a way of formalizing our regard and reverence for life—for our own, that of our fellowmen, of future generations, and of all living things. Intelligent concern for life must include concern for the physical resources on which it depends.

Such concern is innate in most religions. It seemed appropriate, therefore, to ask a churchman on USDA's RAD Advisory Committee, Dr. Henry McCanna, to comment (p. 219) on the role of churches in conservation.

Appropriately, too, the President's recent Message on Natural Beauty (p. 227) lends a fresh emphasis to the stewardship concept.

**Appalachia:** Gene Buie has been SCS's staffman in councils fashioning a regional program tailored to Appalachia's specific economic problems. He is our source of information for a report (p. 221) on how this brave new effort to draw a bypassed region into the mainstream of American economic life will involve districts, watershed projects, SCS, and related agencies.

**Cover:** A small watershed under complete conservation treatment in Garrett Soil Conservation District, Maryland.



## CONTENTS

- 219 The Church in Resource Conservation and Development**  
*By Dr. Henry A. McCanna*
- 221 Action in Appalachia**  
Resource development to help build new economy
- 223 Conservation Therapy**  
Honor camp gives youths outdoor experience  
*By Donald D. Kline*
- 225 Farmers Plant Trees to Beautify New Interstate Highway**  
*By Elmer L. Worthington*
- 226 Clubs and Schools Join Churches in Soil Stewardship**
- 227 A Heritage for Our Descendants**  
From the *White House Message on Natural Beauty*
- 231 Birds and Beauty**  
Russian-olive is prize landscape plant  
*By Olan W. Dillon, Jr.*
- 233 Delta District Cooperators Mechanize Sugarcane Planting**
- 234 District Buys and Restores Farm**  
*By R. H. Boecking*
- 235 Grasses Used in Cropland Shifts**
- 236 Conservation Plan Converts Cropland to Grass**
- 237 District Profile**  
Eldred Sasseen, Oklahoma
- 238 Review**  
World Prospects for Natural Resources; New Publications
- 239 From the Administrator**  
Stewardship and Growth
- 240 Pleasure and Profit From Ranch Resources**

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

BEN O. OSBORN  
Editor

GEORGIE A. KELLER  
Editorial Assistant

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Photos available on request.

**Commercial names:** Mention of commercial enterprises or brand names does not constitute endorsement by the Department of Agriculture.

**Subscriptions:** \$1.75 per year, \$2.50 foreign. Single copy, 15 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.



# The Church in Resource Conservation and Development

By Dr. Henry A. McCanna

*Member, National Advisory Committee on  
Rural Areas Development*

THE churches of America have contributed significant leadership to all levels of the Rural Areas Development movement. This is a natural result of their concern for good community life and the enhancement of individual personality.

The various approaches of Rural Areas Development are a means of responsible ethical action. Never before have so many groups joined together for a single social objective. The well being of the 67 million people who live in town and country areas of less than 10,000 population is at stake. Having contributed to the total national wealth far out of proportion of their numbers, these people now have the opportunity to experience full development.

## Basic Elements

Successful rural area development depends on two important factors that churches can help provide: (1) The programs must be based on local initiative, and (2) the people who need help the most must find an articulate voice.

It is in these matters that dedicated laymen and local pastors can be most helpful. They, more than any other local group, can aid in stimulating local initiative, and they can seek the dispossessed and help them become articulate.

In Custer County, Nebr., a leading church layman is the focal point for local resource development, and the record will show that in nearly every State and local RAD committee such sensitive and effective churchmen provide key leadership.

Usually it is the laymen who are the leaders, but pastors also get involved. A pastor in Mayville, Mich., stimulated a concern for the hungry

---

Dr. McCanna is Director, Commission on the Church in Town and Country, of the National Council of the Churches of Christ in the U.S.A., New York City.



people of the world that has become statewide in its scope.

The need for leadership in area development to provide new jobs in Braxton and Webster counties, W. Va., caused a local pastor to help organize the Braxton County Development Corporation Committee and to serve as its president.

In Jackson, Ohio, one of the finest examples of manpower training and development was spearheaded by a dedicated minister.

Both the lay and professional leaders of the Arizona Migrant Ministry and the Mississippi Delta Ministry are enlisting large numbers of urban as well as rural people into programs that will enable them to obtain equal economic opportunity.

Economic development, and its consequence, social development, can occur only if resources are adequate.

### Resources and Religion

The relationship between the conservation of natural resources and religious development is as old as time and as new as tomorrow. The Bible records that the first commandment given to man was to "replenish (conserve) the earth" (Gen. 1:28).

Among the reasons for the settlement of America by our forefathers were the basic need for a new freedom of religion and a desire for land ownership. And in the development of the United States, opening up of new lands commonly was accompanied by extension of missionary activity.

The institutions of religion, and particularly the local congregation, have always thrived or waned with the availability of soil and water resources. The conservation of these basic resources has been encouraged by the stewardship teachings of religion, and the strengthening of the land has resulted in a cor-

responding extension of religion. It is not accidental that at the center of every flourishing agricultural area is a cluster of religious institutions.

### Rural Observances

With the increase of urban life in the United States, the churches have emphasized more and more the importance of resource development. There have been ever-increasing observances of Rural Life Sunday, Soil Stewardship Week, Harvest Festivals, Freedom From Hunger Week, emphasis on conservation in Sunday Schools and Vacation Church Schools, training courses on the relation of religion and conservation, and outdoor services in State and National parks and recreational centers. Nearly every denominational publishing house includes the concepts of responsible stewardship of natural resources in its literature and especially in worship bulletins and aids.

For more than a decade the Soil Stewardship booklet of the National Association of Soil and Water Conservation Districts has met an ever-expanding demand. In 1964, more than 75,000 of the booklets and 6 million bulletin inserts were distributed in local communities and churches. These materials are prepared by the Association in cooperation with a Soil Stewardship Advisory Committee composed of the national rural church leaders of the major faiths in America.

### Growing Needs

The growing interest of churches in rural observances is a response to a new dimension of change in modern life. In one sense, it might be said that the only constant factor in our society is change. And as changes occur man becomes aware of new and growing needs.

The relatively simple needs of the past for food, shelter, rest, and love have been expanded to

an extent heretofore only imagined in the wildest of dreams. Industrialization and automation enable man to live in surroundings which would have been the envy of yesterday's potentates.

The new leisure promises to fulfill the ancient hope for a Nation of philosophers and artists. Without continuing conservation, however, man's unrestrained appetites can frustrate the fulfillment of his future. As we become aware of growing needs, we must also demonstrate a corresponding increase of responsible conservation. Otherwise, instead of these changes contributing to a healthy society, they may bring forth a diseased giantism that topples of its own weight. ♦

## Through The Centuries

FOR centuries, men of many religious persuasions have intoned: "The earth is the Lord's, and the fullness thereof. . . ."

For centuries, many of these same men defied their words and denied them by despoiling God's earth.

To allow the creative potential of God's earth to be dissipated by neglect, by inefficiency, by greed—this is truly to take God's name in vain, if we believe that the earth is His.

In early days, Jewish farmers believed that the earth had as much right to a Sabbath as man did. They instituted the Seventh Year.

Their descendants all over the world have pioneered in techniques of soil conservation and land use. Not only in reborn Israel, but in Europe, Asia, Africa, and the Americas, 20th century believers in the Mosaic covenant are practicing and teaching day-to-day, season-by-season ways of conserving and refreshing the good earth through which God feeds His children.—RABBI EUGENE J. LIPMAN, *Washington, D. C., Member, National Advisory Committee on Farm Labor.* ♦



**S**OIL conservation, watershed protection, water resource and recreation development, and other activities of the Soil Conservation Service will figure in the program resulting from the recently approved Appalachian Regional Development Act.

The act does not create any new responsibilities for the SCS but the coordinated attack on the resource and economic problems of the region will intensify the work of the Soil Conservation Service and of soil conservation districts in the area.

Congress approved the Appalachian Regional Development Act because of the realization that the rapidly expanding national economy in the past 2 decades has bypassed an important segment of the United States.

Appalachia is a mountainous

**Appalachia can use more than 800 watershed projects. Many will include multiple purpose dams like this one that provides protection and water supply.**

# Action in Appalachia

## Resource development to help build new economy for bypassed region

region. Lack of accessibility, the shortage of skilled labor, and the nature of its natural resources have favored the development of other regions better able to compete in the national market.

Appalachia has been publicized during the past year as a region apart, a land lacking in social and economic opportunities. But Appalachia has many natural assets that can be developed.

Appalachia is in truth a scenic wonderland—a land of forest-covered mountains, ample rainfall, and numerous streams. Its people

are descended from rugged frontier stock and have been independent and self-reliant throughout the history of the Nation.

Appalachia embraces 360 counties in 11 States, namely: Alabama, Georgia, Kentucky, Maryland, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, and West Virginia. The act further provides that 13 counties in New York may be included.

More than 8 percent of the Nation's population lives in this region. But, sad to say, it's 15.3 million people earn less money,





have a higher percent of unemployed and a lower level of education, and they enjoy fewer public services than the people who live in the rest of the United States.

### New Highways

The Appalachian Regional Development Program, authorized by the act and involving cooperative effort between Federal, State, and local levels of government, will help to overcome some of these handicaps.

One of the first and most important features of the program is to construct an Appalachian development highway system of not more than 2,350 miles of new highways and 1,000 miles of local access roads. This system, in conjunction with the Interstate system and other Federal-aid highways, will provide the access necessary to encourage and facilitate the development of the land and water resources of the region.

Eighty watershed projects have already been approved for installation under the Watershed Protec-

tion and Flood Prevention Act. Construction of the planned structural measures has been completed in 15 of these projects. It is estimated that more than 800 similar projects could be developed in Appalachia. These would provide numerous opportunities for the development of planned water-based recreation facilities readily accessible to potential users both within and outside the region.

### Water Supplies

In addition to recreation developments, the watershed projects would offer opportunities for providing water supplies for irrigation, municipal, industrial, fish and wildlife, and water quality control uses.

Flood protection provided by the projects would enable more intensive use to be made of the flood plains for agricultural production and for capital investments.

Small industries could be supported to process agricultural products, utilize locally available natural resources, and provide em-



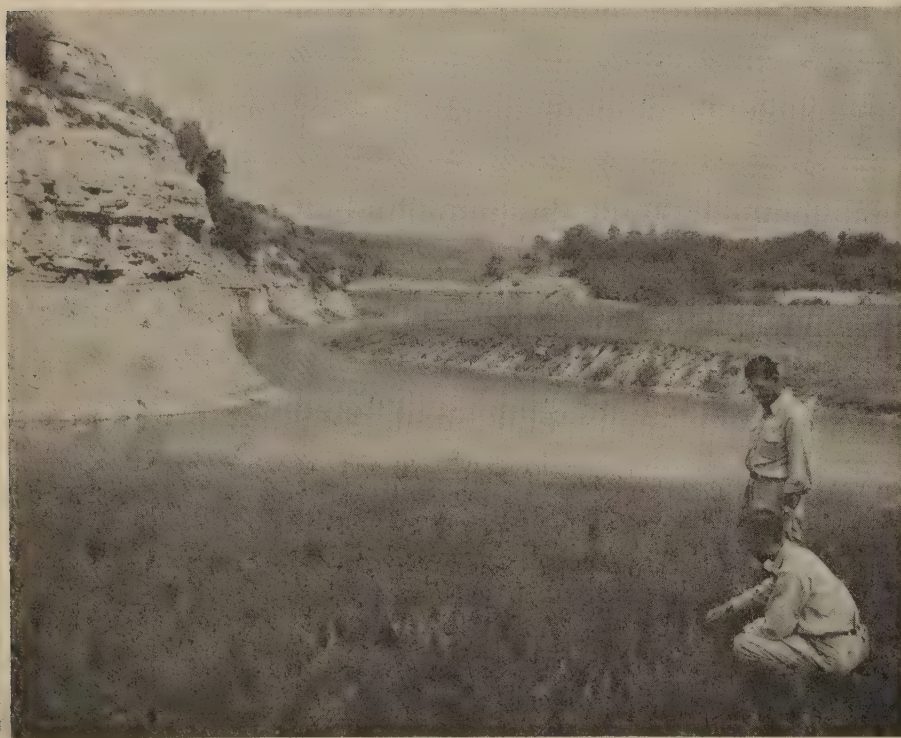
**Watershed projects will relieve Appalachian valleys of recurrent flood damages.**

ployment for the local labor force. Activities of this type would provide for community development on a stable economic base which would be self-sustaining.

A survey of the water resources will be made and correlated with other similar studies that have covered parts of the region. It will provide the basis for planning the coordinated development of the region's total water resources. Such a plan of development can assure that the available water will be put to uses which will contribute most to the region's economy.

### Land Use Adjustments

Conservation activities will be accelerated through the watershed protection programs, the provision for timber development organizations, the restoration of areas damaged by poor surface mining practices, and the establishment of land stabilization and erosion control measures. These efforts will provide opportunities to plan coordinated development and use of



**Fish in the lake and alfalfa on the leveled strip mine spoil are examples of the benefits of reclamation to be a part of the Appalachian program.**



the resources of the area for economic improvement.

Only 30 percent of the land in Appalachia is suitable for sustained cultivation. More than 9 million acres of cropland and about the same amount of pastureland need conservation treatment. Land use conversions are needed on more than 4 million acres. The Appalachian Regional Development Program will provide increased incentives as well as means for carrying out an accelerated program of soil and water conservation, including provisions for long-term cost-sharing contracts for establishing approved measures.

The Appalachian Program will also provide facilities for vocational education to give people the training they need to obtain employment. It will provide for improved health and medical facilities and for improved housing. These are necessary services to assure a dependable labor force.

The Appalachian Regional Commission, formed under the provisions of the law, will provide a focal point for coordinating the various Federal, State, and local programs to assure the balance necessary for economic growth. Such action, combining the means made available through the Appalachian Act with other State and Federal programs, can change Appalachia from a region apart to a region which is a part of the Great Society. ♦

## District Subscribes To Our Magazine

One item in the budget of the Northeast Soil and Water Conservation District of Louisiana is a subscription to *Soil Conservation* magazine for each of the five supervisors.

They consider the magazine a part of "keeping up" with the job, and as such reasonable business expense of the district. ♦



The honor camp buildings were constructed by the boys with materials mainly salvaged from demolition work in Grand Rapids' urban renewal project.

## Conservation Therapy

Honor camp on abandoned farmland gives youths outdoor experience and citizenship training

By Donald D. Kline

*Soil Conservationist, SCS, Grand Rapids, Mich.*

**Y**OUNG men convicted of first offenses against the law in Kent County, Mich., don't wait out their terms in idleness in a jail cell. They get out into the countryside and work at conservation projects assigned to them by the sheriff and his deputies.

"Our experiment is paying off," says Sheriff Arnold Pigorsh, originator of the minimum security project. "By careful screening we are able to keep 90 percent of the 17- to 21-year-olds out of the local jail and away from the influence of habitual criminals. At the same time we're putting soil and water resources to work."

Kent County owns 700 acres of

abandoned farmland in Spencer Township. Three hundred and thirty acres were planted to red and white pine in the late 1930's. Otherwise the land had received little care or attention up until 1961 when Sheriff Pigorsh suddenly had an idea. "Why not use this land as a rehabilitation center for the young first offenders?"

The new jail, built in 1957, was already overcrowded. Sheriff Pigorsh knew of too many instances where "first timers" confined with habitual criminals had become poor risks as future citizens. He worked to get others interested in the idea of a Civilian Conservation Corps type camp to relieve his mounting





**James Emery, SCS conservation aid (l.) and Sheriff Arnold Pigorsh examine Honor Camp conservation photos at the sheriff's office.**

jail population and lessen first offender "repeats." With approval from the Board of Supervisors, the help of civic groups, churches, and professional groups was enlisted to secure building materials and equipment. Most of the construction was done by inmates selected for the camp.

In May 1962, before the dormitory had been completed, Deputy Eli Roberts visited the soil conservation district office. The deputy, and his father too, had been district cooperators in the Kent City area for many years. Deputy Roberts asked if the Soil Conservation Service staff could help him develop a forestry and wildlife plan for 80 acres to be used for the camp.

### **Soil Building Program**

They could and they did. The Rubicon sand and Rousseau fine sand soils had proved to be well suited for pine plantations. Better management was the greatest need. A soil rebuilding program for a 5-acre vegetable and produce garden near the camp was provided in the conservation plan. A shallow well irrigation system was later found to be a "must" for their highly successful garden

project.

The camp complex includes a large dormitory with kitchen and dining room, shops, a recreational building, and a chapel. Another dormitory is planned. One hundred first timers are expected to be housed by January 1, 1966.

A high school extension course is planned for those who are "drop outs." The kitchen training program has already fitted several men for hotel and restaurant jobs, and the industry is reaching out for all available "camp graduates" who have become trained food handlers. Continued conservation forestry training will be provided in the winter and in early spring.

What has been accomplished in the first 3 years? Considerable work has been done in thinning and in pruning the pines. Fire lanes have been cut. The large garden operation, requiring considerable labor, has thrived. Surplus produce has eased the county jail's kitchen budget much of the year. Even more important, the conservation experience "in the pines" has proved its worth in human betterment.

### **Regular Movies**

In 1962, James Emery, SCS conservation aid at the Grand Rapids Work Unit, offered to show conservation movies to the men once a week. Planned originally for only a few weeks of Thursday night movies and discussions, these sessions have now become a regular event. Mr. Emery was asked to come to the camp once a week. Each Thursday evening, for the past year now, he has gone to the camp on his own time, equipped with a different movie on conservation and related subjects.

Sheriff Pigorsh says the response from the inmates has been "terrific." He has high praise for Mr. Emery's voluntary contribution to continuing education.

Kent County officials, Michigan's first to initiate an honor camp, have given the Sheriff fine support. Now, adjoining county officials are considering the idea of sending a few selected first offenders to the camp. Service clubs, churches, industries, and individuals have provided construction materials, equipment, and furnishings. Visitors from the interested groups eat food prepared by the camp cooks—the same as that given to the inmates.

The Rev. Leland A. Hoyer, Protestant chaplain, and Father Vince Kamarauskas, Catholic chaplain, are both pleased with the men's participation in the interdenominational chapel services.

"The Honor Camp has taught these young men to work," said Rev. Hoyer. "They now take pride in their work. They are better prepared for a useful life, and they have gained confidence they need to get along on the 'outside'." ♦

### **Soil Erosion**

Wasteful land use started in the New World when the first English colonists settled in the Chesapeake country in 1607 and continued as settlers went ever westward. For many years no thought was given to conserving the soil except for a few early Americans like Jared Eliot, Samuel Deane, Thomas Randolph, Thomas Jefferson, and others, who wrote and preached about soil erosion. "Early American Conservationists" by Angus McDonald (USDA Misc. Pub. 449), tells about these conservationists.

Not a great deal was done until 1935 when the soil conservation work in most of the agencies in USDA and USDI was gathered together into one agency that later became known as the Soil Conservation Service with H. H. Bennett as chief. That was the first concentrated national effort to control soil and water erosion. ♦



# Farmers Plant Trees to Beautify New Interstate Highway Route

By Elmer L. Worthington

Woodland Conservationist, SCS, Bismarck, N. Dak.

A NOVEL tree-planting program to beautify the view along new Interstate Highway 94 is booming in Burleigh County, N. Dak., and promises to spread to the rest of the State.

Most North Dakotans agree that more trees are needed. The Bismarck Chamber of Commerce, with the help of the local soil conservation district and the Soil Conservation Service, has taken unique steps to get them on the North Dakota landscape.

Bismarck is the State capital and the county seat. By sponsoring a "Beautify Burleigh" campaign, the Chamber of Commerce would set an example for people to see, Manager Art Leno reasoned.

## Corridor of Trees

The idea was to encourage farmers and ranchers to plant windbreaks on their land near the route of the new highway and to get still more trees planted in the zone 3 miles on either side of the right-of-way.

The plantings could be any type the landowner wished to establish. Some would be field windbreaks and others wildlife plantings or simply additions to existing farmstead or feedlot windbreaks. Some would be plantings for recreational developments. A few are small blocks of evergreens for future Christmas trees. The Chamber of Commerce hoped to have the trees planted before the highway was completed.

Fortunately, the soils on both sides of the new highway are suitable for tree growth, except for three salty slough areas totaling about 6 miles in length.

At a dinner meeting 2 years ago, at which the "Beautify Burleigh" idea was explained, the

75 landowners attending pledged their wholehearted support.

## A Good Start

As tree planting sites need to be prepared a year in advance, few plantings were made the first year. In the spring of 1964, however, the planting began in

earnest. By the end of the year, 22 farmers and ranchers had planted 31,105 trees on their land, according to Cliff Wahl, local SCS conservationist.

If highway construction on this segment is completed on schedule, it will be open to traffic late in 1966. Two years still remain for adding to the tree plantings.

"If the tree planting activity continues at the present rate, it will have greatly exceeded the fondest dreams of the Bismarck Chamber of Commerce," Manager Leno says.



ABOVE.—Single row pattern field windbreak is one type adapted in Burleigh County. These were planted in 1959 at 40-rod intervals. BELOW.—A field windbreak of white willow planted in 1959 has reached a growth of 15 feet.





All of the plantings have been made by the tree planting machine and crew of the South Burleigh Soil Conservation District.

"Not only do the owners like the trees, but they have taken exceptionally good care of them, and some of the first trees planted 2 years ago are now 6 to 8 feet high," says Park Hoover of Moffit, chairman of the soil conservation district.

Soon after the "Beautify Burleigh" program started, many farmers and ranchers along other highways wanted to participate. Within a year, the entire county was included in the beautification venture. U.S. Highway 83, which runs north and south through the county, has many fine plantings bordering it. The State, county, and township roads also are blossoming with new plantings in the "line-of-sight" along them.

The "Beautify Burleigh" planting idea has spread to several other areas in North Dakota. In fact, such a program could be expanded to include the land adjacent to the entire Interstate Highway System in North Dakota. ♦

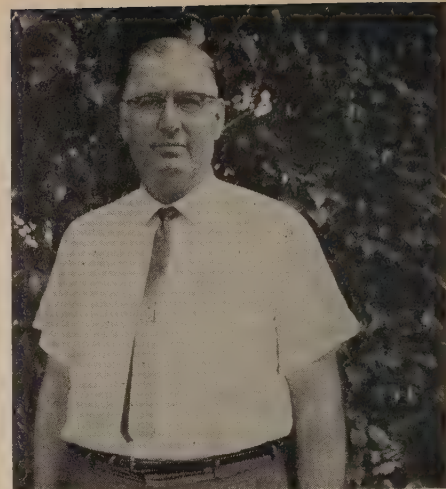
## Clubs and Schools Join Churches in Soil Stewardship

CIVIC clubs and schools, as well as churches and the soil conservation district, join in observing Soil Stewardship Week in Covington County, Ala.

The Andalusia Civitan Club and the Covington County Soil Conservation District jointly sponsor the event. Newspapers and radio stations in Andalusia and Opp cooperate in making the activities successful. As a result people throughout the county—farm and town folks alike—gain a better understanding of their responsibilities as stewards of the soil and the benefits of conservation.

The Rev. J. M. Fuqua, farmer, soil conservation district supervisor, and a full-time Baptist minister, is Soil Stewardship chairman.

Early every May the Andalusia Civitan Club holds a "kick off" meeting. Farmers, agricultural workers, and county and city officials are special guests. Rev. Fuqua



Rev. J. M. Fuqua.

and others make talks and distribute packets of material prepared by the National Association of Soil and Water Conservation Districts.

Much of the success of the activity is credited to Rev. Fuqua's vigorous leadership. For more than 20 years he has been a community figure in the Andalusia, Opp, and Salem sections of the county. He has headed the local observance for 6 years and was State Soil Stewardship chairman in 1960.

Rev. Fuqua operates a 450-acre farm south of Andalusia. He raises beef cattle and hogs, grows corn, peanuts, and pine trees, and has a year-round pasture program. He buys hogs and cattle and fattens them for the market.

Rev. Fuqua was born only a mile and a half from his present home. He remembers when there were red, eroded hills and gullies where now are green pastures, pine trees, and farm ponds.

Members of the West County Line Baptist Church near Opp, where he preaches, have fully paid for their attractive new sanctuary and Sunday School rooms. Good conservation practices and farm management have had a prominent part in the financial success of their church and community, according to T. R. Saunders, chairman of the church's board of deacons—CHARLES H. HARPER, *Area Conservationist*, SCS, Ozark, Ala.



One of the first "Beautify Burleigh" tree plantings was made on Lloyd Salter's farm at Menoken. The owner is on the tractor with Paul Jahner and Vern Hoover operating the district's tree planting machine while Don Tracy, president of the Bismarck Chamber of Commerce, looks on.



# A Heritage for Our Descendants

A Conservation Challenge  
From the White House Message on Natural Beauty

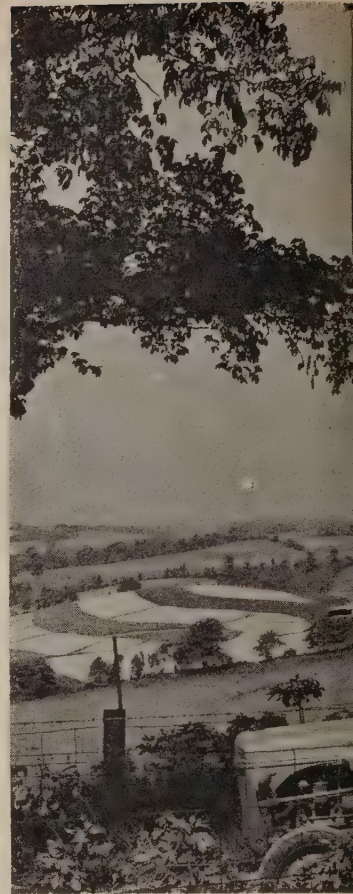


*"Beauty is not an easy thing to measure. It does not show up in the gross national product, in a weekly pay check, or in profit and loss statements. But these things are not ends in themselves. They are a road to satisfaction and pleasure and the good life . . ."*

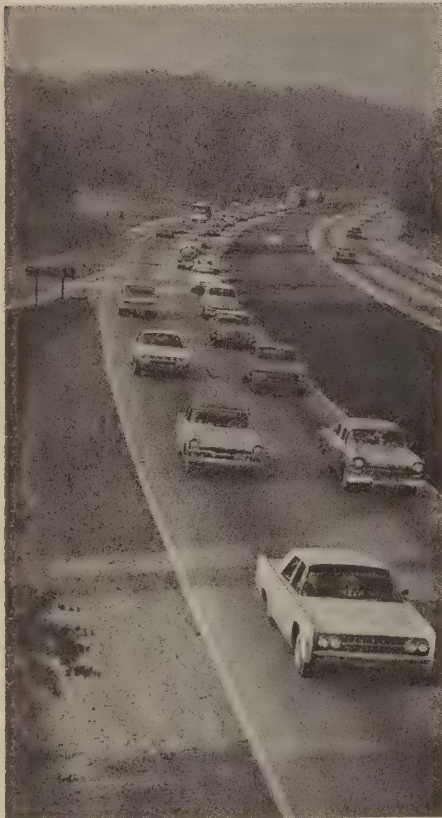




*"Association with beauty can enlarge man's imagination and revive his spirit . . ."*



*"What a citizen sees America . . ."*



*"By making our roads highways to the enjoyment of nature and beauty we can greatly enrich the life of nearly all our people in city and countryside alike . . ."*

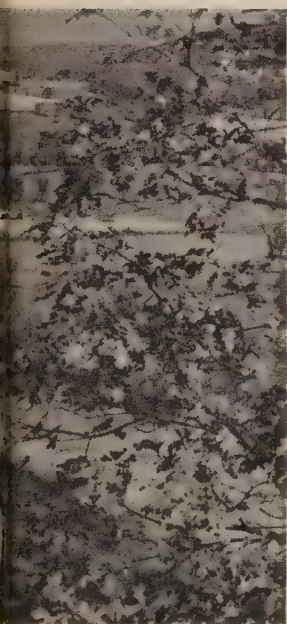


*"Nothing was a greater source of wonder power and majesty of American rivers . . ."*





every day is his



and amazement than the



*"Certainly no one would hazard a national definition of beauty. But we do know that nature is nearly always beautiful . . ."*



*"We will continue to conserve the water and power for tomorrow's needs with well-planned reservoirs . . ."*



*"The time has come to identify  
and preserve free-flowing stretches  
of our great scenic rivers . . ."*



*"A prime national goal must be  
an environment that is pleasing to  
the senses and healthy to live in  
. . ."*



#### PHOTOGRAPHS

1. Farm in the Guyan Soil Conservation District, W. Va. (America the Beautiful).
2. Irrigated valley in Wyoming. (WYO-664).
3. Stripcropping in Spoon Creek Watershed, Coshocton Soil Conservation District, Ohio. (78,980).
4. Walking in woods, Lower West Red River Soil Conservation District, La. (La 62,628).
5. Highway in northern Virginia (N-47678).
6. Farms along the Susquehanna River, Bradford County Soil Conservation District, Pa. (FS 453897).
7. Floodwater-Retarding Structure No. 10, Johnson Creek watershed, Tenn. (Tenn-D10-31).
8. Waterfalls above floodwater-retarding dam in Oliverian Brook watershed, N. H. (N.H. 169)
9. Conservation farm, Frederick Soil Conservation District, Md. (Md-30,211).



**R**USSIAN-OLIVE is coming to town and is bringing the birds with it.

The conservation uses of this plant long have been known in rural areas for farmstead and field windbreaks, snow traps, gully and streambank plantings, hedgerows, and living fences.

Urban dwellers now are using it for hedges, screens, waste areas, odd corners, and to attract birds. Russian-olive trees and a bird feeder are an effective combination to attract both seed- and fruit-eating birds.

Russian-olive is a native of Europe and Western Asia. In the United States it is adapted to the Western and Great Plains States. Few other trees have such wide adaptation to soil and climate. Its silvery foliage and graceful irregular shape make it an attractive plant for many kinds of landscape plantings.

The plant is a spreading, shrubby tree that grows up to 20 feet tall under normal rainfall conditions. It grows larger when it has extra water and fertility. When allowed to grow without pruning its lower branches spread to 20 feet in diameter. When planted with close spacing and proper pruning, Russian-olive makes a dense attractive hedge.

## Birds and Beauty

# Russian-Olive is Prize Landscape Plant in West

**By Olan W. Dillon, Jr.,**

*Biologist, SCS Regional Technical Service Center, Ft. Worth, Tex.*

It also makes a fine shade tree up to 40 feet high when all but one of the lower stems is removed and it is kept free of branches close to the ground.

Plantings that are well cared for and watered produce seeds in 3 to 5 years. Highly fragrant small yellow flowers appear in early summer. Whitish or silvery fruits mature in the early fall. There are several pink- or brown-fruited varieties that produce larger fruits than the silvery variety. Birds, however, prefer the white fruits over the other kinds.

Russian-olive thrives from sea level to at least 8,000 feet elevation and withstands temperatures ranging from 50° F. below zero to 115° above. The salt tolerance

of the plant is surpassed only by saltcedar (*Tamarix*) and a few other plants. It survives best in alkaline soils. It does not thrive in acid soils although an occasional plant may survive in such soils in yards in the Northeastern United States.

Forty-three birds, listed on the next page, are known to eat Russian-olive fruit.

The author has 10 Russian-olive trees in his yard in the City of Lakewood, Colo., that have provided some interesting birding experiences.

Last winter, seven Wilson's warblers ate insects on the trees until cold weather drove them south.

House finches have used the trees yearlong and fed on the fruits all winter, as did house sparrows.



Left to take its normal form, Russian-olive makes a spreading shrub that provides birds excellent escape cover.



Russian-olive makes a fine shade tree when the lower branches and sprouts are pruned until the tree is formed.



### Birds That Eat Russian-Olive

Mallard	Townsend's
Blue grouse	solitaire
Sharptailed grouse	Cedar waxwing
Gray partridge	Phainopepla
Bobwhite	Starling
Scaled quail	Brewer's
California quail	blackbird
Gambel's quail	Common grackle
Ringnecked	Cardinal
pheasant	Evening grosbeak
Chukar	Cassin's finch
Wild turkey	House finch
Mourning dove	Pine siskin
Roadrunner	House sparrow
Redshafted flicker	Lesser
Blackbilled magpie	goldfinch
Common crow	Greentailed towhee
Mockingbird	Rufoussided
Catbird	towhee
Brown thrasher	Slatecolored
Sage thrasher	juncos
Robin	Oregon junco
Eastern bluebird	Whitecrowned
Mountain bluebird	sparrow
Bohemian waxwing	Song sparrow

Several robins spent the winter with us, feeding on the Russian-olive fruits until the ground thawed and they could go back to catching earthworms.

The most interesting winter birds feeding daily on the seeds were evening grosbeaks and Bohemian waxwings. A feeder next to the trees offered sunflower and millet seeds. The sunflower seed is especially attractive to the

grosbeaks.

Sometimes as many as 200 Bohemian waxwings would be in the trees at one time. When most of the Russian-olive seeds had been eaten, we started sticking raisins on the spines of the trees to keep the birds coming in.

Late winter brought a wave of Cassin's finches. They would be in the trees and at the feeder shortly after daylight and would spend most of the day close to the trees. As the spring migration started the Cassin's finches were joined by whitecrowned sparrows. They stayed until they moved into the high country to nest.

Just after the Cassin's finches and whitecrows left, a redwing blackbird set up a courting territory on the highest Russian-olive tree. A lot of fighting between males took place, but when the females moved in they all moved down the hill to nest in the cat-tail marsh.

A pair of Bullock's orioles nested in a cottonwood tree close-by. When the young were fledged they used the Russian-olives as a headquarters area and left it only when the sour cherries were ripe.

Redshafted flickers fed regularly on insects in the bark of the trees during summer. We also had house finches and house sparrows all summer and a pair of doves raised two young in the denser part of the trees.

In early fall the Wilson's warblers were back on their way south. In addition, we have seen a McGilveries warbler, several Lincoln sparrows, and lesser goldfinches.

Russian-olive has come to town and some of us city dwellers are enjoying it with the bonus of bird-life that it attracts.

Additional information on Russian-olive can be obtained from your Soil Conservation Service technician or from USDA Leaflet No. 517, "Russian-Olive for Wildlife and Other Conservation Uses." ♦

## Minister Builds Farm and Church

A MINISTER who is also a practicing conservationist has rebuilt a farm and a church for a Mississippi community.

Rev. J. A. McRaney, pastor of the Monerey Methodist Church near Florence, in 5 years converted about 500 acres of rundown land into a garden spot, returning most of the profit to the church.

As a cooperator with the Rankin County Soil Conservation District, he established 212 acres of improved pasture, built two farm ponds, and healed gullies by relocating roads and vegetating the ditches.

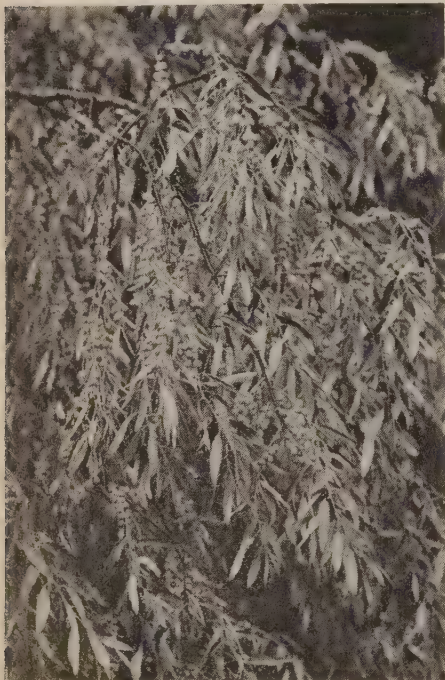
As a result of good woodland management, he now has about 300,000 feet of salable timber.

James L. Bishop, SCS soil conservationist, of Brandon, provided technical assistance.

When Rev. McRaney accepted the pastorate in 1959, the Monerey Church had only 30 members and conducted services every fourth Sunday. Now there are 102 members and regular weekly services, including a full program of youth activities.—W. C. NELMS, *Assistant State Conservationist, SCS, Jackson, Miss.* ♦

### Benefits From a Ranch Conservation Plan

Some of the benefits of a ranch conservation plan, reported in "What Is a Ranch Conservation Plan?" (USDA PA 637), are: (1) Reduction of soil loss and better use of water resources, (2) increased grass production and improved quality of forage and feeds, (3) more calves weaned each year, with heavier calves at weaning age, (4) more dependable income, and (5) supplemental income from fee hunting, campgrounds, picnic areas, and other outdoor recreation enterprises. ♦



Russian-olive produces abundant fruit that remains on the tree in winter until consumed by birds.



## Delta District Cooperators Mechanize Sugarcane Planting



Leonard Julien demonstrates the placement of cane in the furrow by the mechanical planter.

**T**WO Louisiana soil conservation district cooperators, who recently gained recognition for inventing a mechanical sugarcane planter, not only believe in saving labor but also in conserving the soil of their 924-acre farm.

They are the Julien brothers, Leonard and Harold, of Modeste, La., who began rotating their sugarcane with other crops and doing simple drainage years ago when they farmed the land with their father Anthony Julien.

By 1952, the brothers had recognized the need for instituting organized conservation measures on their jointly operated farm. That year Leonard Julien signed a cooperative agreement with the Lower Delta Soil and Water Conservation District and developed a con-

servation plan with the aid of his brother and an SCS conservationist.

The plan called for a 3-year rotation of sugarcane with corn and soybeans, construction of a complete water-management system, renovation of pastures, seeding of cover to be used for green manure crop, and the use of all crop residue for soil protection and improvement.

Except for part of their drainage system, all these conservation measures and others have been carried out by the brothers. And so their district is proud of their conservation work as well as their revolutionary invention.

Said Andrew P. Gay, president of the American Sugarcane League and a member of the Board of Supervisors of the Julien brothers' conservation district, "I'm delighted to learn that what appears to be the first practical, satisfactory sugarcane planting machine is being developed by cooperators in our conservation district."

John B. Landry, SCS work unit conservationist with the district, praised the brothers upon their labor-saving invention.

The machine can plant 12 acres a day with a complement of 5 men, 2 tractors, and 3 small wagons, compared with 16 men, 4 tractors, and 8 wagons by present method.

Using three sets of tongs, the machine pulls the cane off a cart and drops it into open furrows. A tractor follows to cover the cane. In the dropping process, the cane is guided into proper position by a troughlike metal arrangement.

The brothers did some of the work on their tractor-drawn machine in their own well-equipped farm shop. But most of it was done in a Donaldsville machine shop. Estimated cost of building the machine is placed at \$3,000. ♦



Leonard (l.) and Harold Julien, inventors of a mechanical sugarcane planter, are long-time soil conservation district cooperators.



# District Buys and Restores Farm To Demonstrate Good Practices

By **R. H. Boecking**

*Work Unit Conservationist, SCS, Scotts Bluff, Nebr.*

**F**OR a generation the supervisors of the Scotts Bluff Soil and Water Conservation District, Nebr., have been saying that conservation is good business.

The district, located in America's "Valley of the Nile," includes 450,000 acres of fertile, highly productive irrigated land.

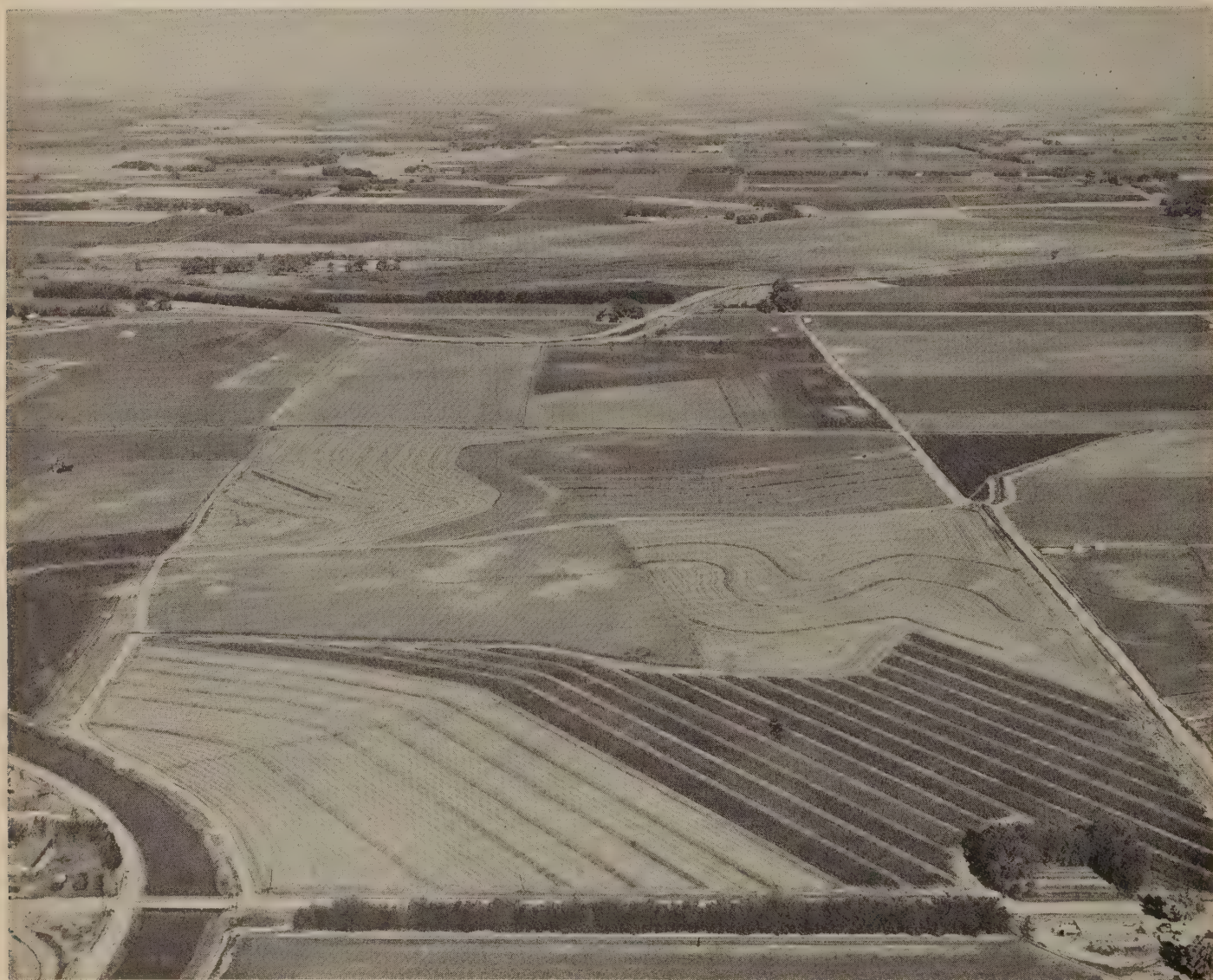
The board recognized the need for developing a conservation irrigation farm—a farm to demonstrate the latest soil and water saving practices and techniques to its 2,800 cooperators, a farm to set the pattern for the needed land treatment program in its 12 major watersheds.

The board bought the tract—80 acres of rough, eroded irrigated land—in 1956. It was sandy and sloping, typical of many farms of the area where wind erosion and poorly controlled runoff were major problems.

## Poor Soil Condition

Examination by the SCS soil scientist found the soil compacted, low in organic matter, and deficient in zinc. The inefficient irrigation system wasted 40 percent or more of the water.

The conservation plan developed by the district supervisors and the conservationist called for contour



The 80-acre irrigated farm owned by the Scotts Bluff Soil and Water Conservation District lies in the immediate foreground. It is completely protected by conservations practices, including irrigation benches, terraces, grassed waterways, and shelterbelts (Photo courtesy of Scotts Bluff SWCD).



bench-leveling of 55 acres and seeding of 21 acres to grass and alfalfa.

It provided for reorganizing the irrigation system, including straightening a large company ditch, removing moisture-consuming cottonwoods along the canal, installing new weirs and turnout boxes, lining 1,500 feet of ditch with concrete, and laying 4,700 feet of irrigation pipe.

To protect low-lying benches from runoff, the plan called for a 1,500-foot diversion terrace emptying into a new grassed waterway.

A heavy stand of reed canarygrass mixed with switchgrass, brome, western wheatgrass, and tall fescue would take runoff and irrigation tailwater to a drop inlet grade-control structure and into a drain.

The conservation cropping system calls for alfalfa seeded with corn the first year, alfalfa the second year, potatoes the third, beans the fourth, and sugar beets the fifth year.

To correct the compacted soil condition, they had the fields chiseled to a depth of 44 inches. Under the district's supervision, the operator applies manure annually to beans and beet crops and adds phosphorous and nitrogen as tests show the need.

As a final conservation step, the board had 2 acres planted to trees and shrubs for wildlife.

### Conservation Cropping

The board sizes up the conservation results this way: Complete elimination of erosion, water waste reduced to 10 percent, prevention of loss of soil nutrients due to excess irrigation, year-by-year improvements of soil condition, and reduction in labor needed.

More important—and the real reason for buying the farm—there has been a marked increase in the application of the conservation practices on cooperators' farms throughout the district.

Hundreds of school children, local farmers, businessmen, professional conservationists, and foreign agriculture specialists have visited the demonstration farm.

The Scotts Bluff board is proud

of its achievement with the farm that a few years ago would have been appraised as a poor business venture and a community liability. They are proud enough to call it their "Farm of Tomorrow." ♦

## Grasses Used in Cropland Shifts



Thirty varieties of native and tame grasses in the grass variety plot let landowners compare results before deciding what grasses to use.

**A**N experimental plot of 30 grass varieties has become a favorite gathering place for pasture-minded South Dakota farmers and ranchers.

The grass plantings are a joint project of Aurora County Soil Conservation District supervisors, the Cooperative Extension Service, and the Soil Conservation Service unit at Plankinton. Their aim is to help farmers and ranchers in the district see for themselves the behavior and productive potential of various grasses available for pasture use.

Most of the grasses are varieties of tame pasture grass that figure importantly in the more stable and prosperous agriculture of the State. Others are the always dependable native grasses that are the foundation of the livestock industry throughout the northern Great Plains.

Among the interested visitors at

the demonstration plot are participants in the Agricultural Conservation Program and the Great Plains Conservation Program. These programs offer cost-share help in converting land unsuited or not needed for cropland to permanent grass or tree cover.

The plot is an outdoor display case of the grasses a landowner may choose in shifting cropland to other, and frequently more profitable, conservation uses.

After a stop at the grass variety plot, visitors often go to view field plantings of the grasses, such as brome grass and sundangrass pastures on the Francis Bruns farm northwest of Plankinton. Mr. Bruns developed the brome grass pasture 8 years ago.

The plot has been an important factor in the steady expansion of tame pasture acreage in the district.—MAURICE E. AHERN, *Work Unit Conservationist, Huron, S. Dak.* ♦



# Conservation Plan Converts Cropland to Grass

WITH the exception of some additional acreage which he wants to plant to grass, Alvin Spitzer has completed, within 4 years, all the steps of a conservation plan covering his 1,097-acre livestock farm in the Kidder County Soil Conservation District in south-central North Dakota.

In 1960 Mr. Spitzer made the decision to reduce his feed grain acreage, to convert most of his cropland to grass, and to increase his cow herd to 150 head. The change would leave only 120 acres of cropland for production of feed, but he expected income from the herd to offset the cropland reduction and reduced expenses to leave an increase in net return.

Mr. Spitzer based his plans on information provided by the Soil Conservation Service. He entered into a contract under the Great Plains Conservation Program, and also used cost-sharing available from the Agricultural Conservation Program.

The conservation plan included



Alvin Spitzer checks his cattle grazing on fall pasture on land converted from cropland.

provision for more water in the right places for proper use of his grass resources. Two springs were developed, and three stock-water dugouts were constructed. Five miles of single-row tree windbreaks and a farmstead windbreak were installed. Fencing was erected to protect grass seedings and manage grazing. The cultivated land was stripcropped.

Mr. Spitzer is sure that when another 70 acres is planted to grass

as planned, he can soon increase his cowherd. When the grain crop justifies, he will feed out a part of his calf crop, adjusting the number of animals each year to the condition of the grass.

His installed farm plan won for him the 1964 Kidder County Achievement Award as an outstanding conservation farmer. More importantly, it brought him a more stable income and the satisfaction of knowing that erosion is under control on his land. He also has more time now to devote to problems of management, an important item these days in the life of a successful farmer.—LARRY VAN BERKOM, *Work Unit Conservationist, SCS, Steele, N. Dak.* ♦



One of the stock-water dugouts constructed in native pasture on the Spitzer farm.

## Natural Resources

Fundamentally, natural resources are as important to the Nation's survival and welfare as they ever were. Land and its products, water, mineral fuels, and the nonfuel minerals still are the indispensable physical stuff that provides the material basis of modern civilization. Indeed, in those uses that serve recreation and the enjoyment of beauty the contribution of land and water are far more than material. — HANS H. LANDSBERG, in *"Natural Resources for U.S. Growth."* ♦



## Eldred Sasseen

Oklahoma

# Busy Conservation Leader



### DISTRICT PROFILE

**S**ERVICE to his fellow men through his church and his soil conservation district take top priority among the many activities of Eldred Sasseen, chairman of the Washita County Soil and Water Conservation District, Oklahoma.

He gives first place to his work as minister to rural congregations of the Church of Christ.

Second comes the soil conservation district which was the State's 1964 Goodyear award winner. This honor climaxed 11 years of leadership by a strong board of supervisors in a wide-ranging program.

In third place Sasseen would put a host of assignments on committees and councils on community, county, area, and State levels—in agriculture and in other areas of public interest. In 1962 he was president of the Washita County Farm Bureau.

### On His Own Land

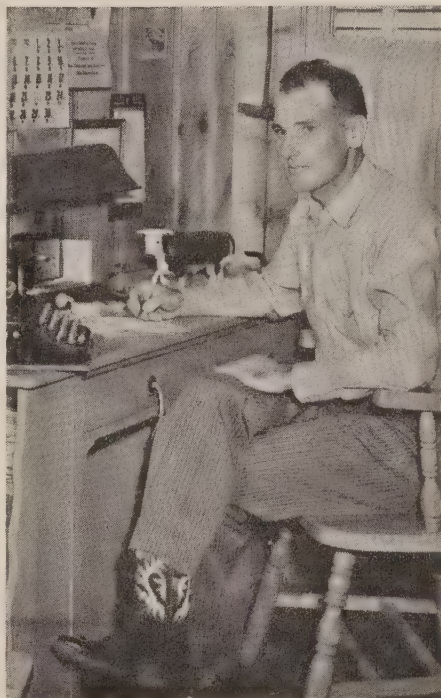
Then comes his service as a rancher—service through the conservation of the portion of the Nation's natural resources that make up his 1,360-acre ranch.

In 1948 he became a cooperator with the Upper Washita Soil and Water Conservation District, which included the area now in the Washita County District.

He was a young farmer-rancher with some good cattle, some good grass, a little good farmland, and a great deal of marginal cropland and depleted rangeland.

Cultivated fields shrank as he planted range grasses. Range condition improved as he built a management program. Then Sasseen enlarged and improved his herd and extended his holdings.

Following his district conserva-



tion plan, and later his Great Plains conservation plan, he was on his way toward building his present ranch enterprise with its basic herd of 142 registered Hereford cattle. Only 40 acres are left in cultivation, and 498 acres have been retired to grass.

Sasseen won the State soil and water conservation district speaking contest in 1950. When the Washita County part of the parent district became a new district in 1953 he was appointed supervisor, along with Frank G. Kliewer, a member of the Upper Washita Board and president of a bank at Cordell, the county seat. Augie B. Sewell, W. G. Nash, and Ed Bose were elected to the board at that time and are still serving.

Since its organization the district has had strong leadership and wide support from town and rural people. It has conducted a chal-

lenging program and has attempted to meet the needs of its cooperators.

It has regularly maintained native grass drills, bermudagrass planters, and other equipment, as well as a supply of grass and legume seed and other planting stock not available on the local market. Sasseen has, for many years, given personal supervision to harvesting bermudagrass roots.

When suitable space was not available for the Soil Conservation Service office, he and the other district supervisors personally underwrote a loan for \$12,000 to build modern quarters for the unit.

### A Watershed Record

The district has made an enviable record in watershed activities. It was in this county that Cloud Creek, a tributary to the Washita River, became the Nation's first completed watershed project. There, national leaders met to dedicate the upstream concept of watershed conservation in July 1948.

Now planning is complete on 8 of the 9 watersheds that lie wholly or partly within the district. Construction is complete on 3, nearly complete on another, and a fifth is under construction. Ninety-five flood detention reservoirs are planned, 46 are built, 17 are under construction, and easements have been cleared on another 27 sites.

A Frank G. Kliewer Memorial Dinner each spring honors outstanding district cooperators and their wives. Attendance runs around 400. It is sponsored by the bank and the district which he served long and faithfully. F. G.



Kliwer, Jr., now president of the bank, is an associate supervisor of the district.

This, in bare detail, pictures the district which Sasseen heads, and its program.

Sassen attributes the outstanding program to all members of the board, to active associate supervisors, to dozens of volunteer workers, and to support of farm and urban interests. He is right. But these are the men who have called on him for leadership each year, and who have responded to the challenge of full development of the district's land and water resources. ♦



**World Prospects for Natural Resources.** BY JOSEPH L. FISHER AND NEAL POTTER. 1964. *Resources for the Future, Inc., Washington, D.C. (The Johns Hopkins Press, Baltimore).* 73 pp.; paper. \$1.50.

This is a brief but useful appraisal of the adequacy of natural resources of the world to meet future demands in the face of the population explosion.

The availability of data for the United States made this part of the job relatively easy. The conclusions reached about agriculture correspond with those made by the Department of Agriculture; namely, that agricultural products in the United States will be adequate—even ample—for the rest of the century, providing the rate of discovery and use of agricultural technologies continues.

However, food output per capita in Latin America, Asia and Africa is no better than 25 years ago. Well fed areas like the United States and Western Europe consume 50 percent more calories per capita than do the poorest areas of the world. The difference means

partial starvation for millions of people.

The authors conclude that the situation is not hopeless, even in face of the world population explosion. They cite evidence of sufficient natural resources to support present levels of living, provided much more effort is directed to education to improve skills in production technology as well as in government and world trade.—GLADWIN E. YOUNG, *Associate Administrator.*

## New Publications

### Soil and Water Conservation Needs — A National Inventory.

BY CONSERVATION NEEDS INVENTORY COMMITTEE OF THE U.S. DEPARTMENT OF AGRICULTURE. 1965. *USDA Misc. Pub. 971.* 94 pp., illus. 60¢.

This "interpretive" report provides a narrative discussion of the data first presented in "Basic Statistics of the National Inventory of Soil and Water Conservation Needs" (USDA Stat. Bul. 317) in 1962.

Chapters prepared by specialists of the Department's Conservation Needs Inventory Committee analyze and evaluate the findings in their respective areas of interest; namely, land capability and land use; conservation treatment needs of cropland, of pasture and range, of forest and woodland, of other land in agriculture, and of non-agricultural land; and watershed project needs.

Numerous tables of data, uniformly summarized by regions and for the 48 mainland States as well as the entire United States, make many significant comparisons that were not readily evident in the basic data published without comment or manipulation in "Basic Statistics." For example, regional subtotals are shown as percentages of the national total, and such crucial items as acreages needing treatment are expressed also as

percentages of total area having the problem or in the use under consideration.

The major conclusions are represented graphically against a uniform regional map background. Photographs further help the reader visualize the subject matter of the inventory.

**Petit Manuel de Conservation des Eaux et du Sol.** BY ALBERT B. FOSTER AND ADRIAN C. FOX. [undated] *Centre Regional d'Editions Techniques, Paris. Techniques Americaines 75.* 59 pp., illus. This first translation of "Teaching Soil and Water Conservation" by two SCS information specialists was arranged through the Agency of International Development, Department of State. This popular youth handbook has had a combined distribution in the United States of more than 2 million in 4 different versions: "Teaching Soil and Water Conservation — A Classroom and Field Guide" (PA-341), "Soil and Water Conservation Activities for Boy Scouts" (PA-348), "Soil and Water Conservation Projects and Activities — A Guide for 4-H Club Leaders" (PA-377), and "Soil and Water Conservation Activities—A Guide for Leaders of Camp Fire Girls" (PA-391).

**Conservation Highlights 1964.** 1965. *USDA, SCS. Unnumbered.* Digest of the progress report of the Soil Conservation Service in a 6-page foldout.

**Watershed Program Evaluation, Honey Creek, Iowa.** 1965. *USDA ERS-204.* 81 pp. An evaluation report on the actual benefits and conservation practices between 1955 and 1960 and the planned benefits and practices in this pilot watershed project with recommendations for changes in techniques and methods of evaluation.

**The Race for Inner Space.** 1964. *U. S. Dept. of Int.* 75 pp., illus. 55¢. In "A Special Report to the Nation," prepared by the Division of Information, Office of the Secretary, the Department of the Interior, appraises and explains the activities of its several bureaus in the national effort to preserve quality and beauty in man's environment. The attractive booklet gives interesting insights into that Department's concern for "the preservation of balance and sanity and solitude on our own planet" as opposed to "the acquisition of real estate on other planets." ♦



From the Administrator:

## *Stewardship and Growth*

EVERY American is a steward of the land whether he lives in the city or the country. Each has a vested interest in the land—each is dependent upon it and each is responsible for its care.

During Soil Stewardship Week, May 23-30, we are reminded that conservation of the land is a daily concern, every day of the year.

The theme of Soil Stewardship this year is "The Challenge of Growth." Never in our Nation's history has growth posed so great a challenge as it does today — growth of population, of great urban concentrations, of demands upon our natural resources, of infringements upon the beauty of the rural landscape.

One result of this dynamic growth is to shrink the broad and bountiful land, and to call for a more dedicated stewardship on the part of all Americans.

A beautiful countryside stems from a prosperous soil and clean-running streams. We have accomplished much to preserve the beauty and prosperity of our land and to restore it where the soil and waters have been mistreated or uncared for. We must not falter in our dedication and our resolve to carry on the job—to spirit it forward at a greater pace in keeping with the compelling requirements of the Nation.

The Soil Conservation Service and the soil and water conservation districts have a special responsibility for care of the land. What account can we make of our stewardship?

With the cooperation of an interested and far-sighted Congress, the soil and water conservation program has made significant advances. SCS conservationists have

worked for more than a quarter of a century with local district supervisors and with farm and ranch cooperators to bring life, vitality, and beauty to much of the rural landscape.

These workers can point to land that now flowers where once it lay barren; to earth that holds firm where once it washed or blew away; to livability on land that once was unlivable. But not all the land. We have progressed; we have not yet arrived.

In resource conservation, each success is a benchmark. We can never be satisfied until all the land is used within its capability and assured that it will continue to be used wisely through enduring application of sound soil and water conservation practices.

This is a constant task, as constant as the need of living things for nourishment. The conservationist is concerned with keeping the land alive. He knows that the land too often has died for lack of care.

The ugly menace of erosion and depletion continues to scar much of our land, to rob us of our essential topsoil, to scourge our streams and reservoirs, to undermine the foundation of our existence. A recent interpretive report of the National Inventory of Soil and Water Conservation Needs lists soil erosion as the dominant conservation problem on private rural land in the United States.

Conservation problems, the report tells us, still are inadequately treated on 62 percent of the cropland, 73 percent of the non-Federal pasture and range, and 55 percent of non-Federal forest and woodland.

To these rural needs must be

added the mounting problems of soil and water conservation in and around the Nation's rapidly expanding urban developments.

Every American, as a conservationist in his own right, would do well, I think, to look hard at the scarred earth where it has been stripped and left to erode, to examine the streams and lakes that are clogged with sediment, to note where the beauty of the countryside has been sacrificed. The Nation could not afford this to happen, but it did happen. It happened because stewardship of the land was wanting; because as keepers of the land the people failed in their service.

The margin of life is thin, indeed, under our feet. Our most productive soil is a shallow layer spread over an inhospitable land-mass. When it is gone it cannot be replaced. When it has gone, as history tells us, nations and entire civilizations have declined and vanished.

We know what it takes to protect the life-giving soil and to keep the water running clean, as we build a greater America. We know that growth can be accomplished without destruction of the basic resources upon which our prosperity and future depend. This, indeed, is our stewardship responsibility.

The immediate need is to conserve. Prevention is our first responsibility. It is, by far, the least costly of the alternatives.

Prevention is the soul of the program of the Soil Conservation Service. And as we work to prevent destruction and loss of our most precious natural resources—which includes the beauty of the landscape—we build.

—D. A. WILLIAMS



If your address changes, please notify us of your complete new address, including Zip Code number, and include old address with our code number as shown above.

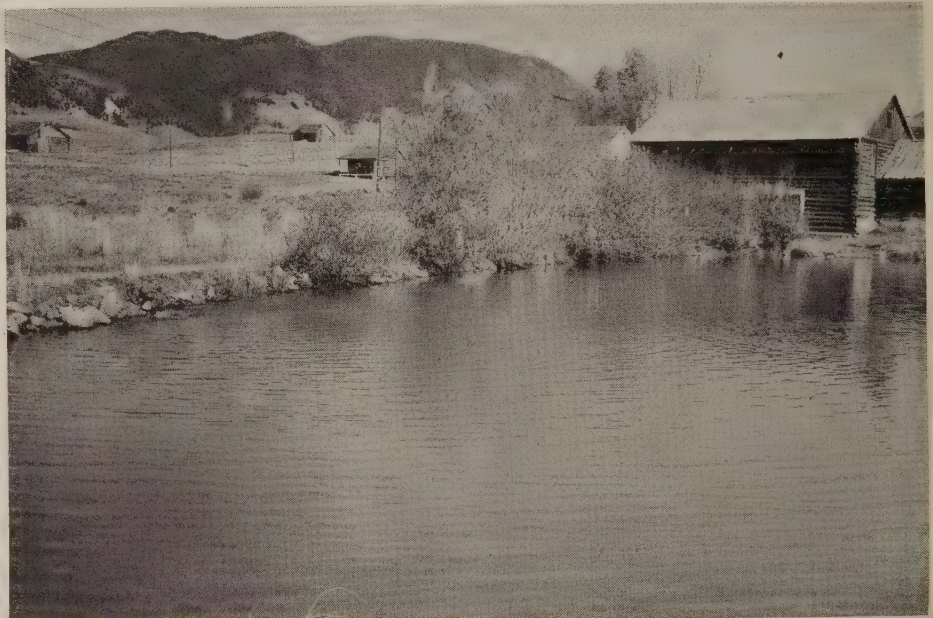
## Pleasure and Profit From Ranch Resources

**O**WNER of the Soward ranch southwest of Creede, Colo., pert, 74-year-old Mrs. Emma McCrone, attributes the success of the operation to the way three principal resources of the ranch—grass, water, and wildlife—are used in combination.

Mrs. McCrone operates the ranch with the help of her daughter and son-in-law, J. Howard Lamb. As cooperators with the Rio Grande Soil Conservation District, they follow a conservation plan that combines the resources into a balanced operation. Besides building 15 cabins, 8 reservoirs and lakes (4 of which provide sport for anglers), and improving the irrigation facilities, they have improved sections of stream channel and practiced good range management.

The ranch is in high country, the headquarters at 9,000 feet elevation. Peaks, some more than 14,000 feet high, are on all sides. The Rio Grande River angles across on the north, and the Rio Grande National Forest joins the ranch on the south.

The area is steeped in the lore of the mining West. Creede itself—where in the pioneering days, according to a rhyme, “there was no night”—bears the stamp of its colorful mining history. Across



Summer cabins dot the hillside near a rearing pond for trout on the Soward ranch.

Slumgullion Pass is Cannibal Plateau, a storied landmark. Fremont's party was trapped by snows in the mountains to the northeast in the days of exploration.

Revenue of the ranch is from a variety of sources. The grazing is leased by the animal-unit-month from June through September. An 82-acre mountain meadow produces hay for market, and 200 acre-feet of irrigation water are sold to a valley farmer.

The cabins are rented to vaca-

tioners through the summer and to hunters in the early fall. A group from Texas leases a 540-acre pasture for recreation use in the summer.

To Mrs. McCrone the ranch is both home and a going business that provide both pleasure and profit from wise use of natural resources — WILLIS HAMMOND, RICHARD PORTER, AND R. D. ANDERSON, *Soil Conservationist and Work Unit Conservationist, Monte Vista, and State Soil Conservationist, SCS, Denver, Colo.*, ♦



15635

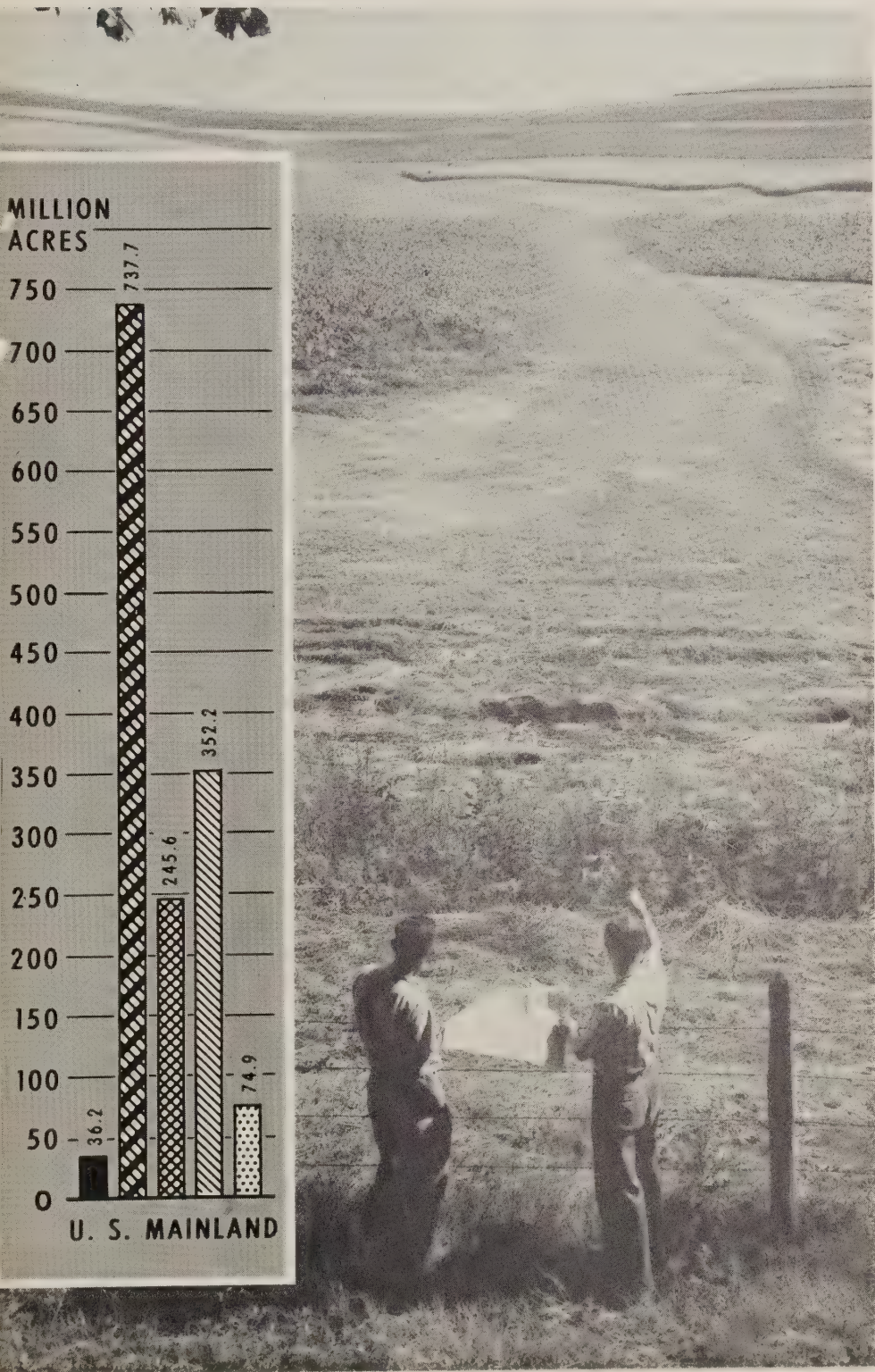
U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

JUN 9 - 1965

CURRENT SERIAL RECORDS

JUNE 1965  
VOL. XXX, NO. 11

# Soil Conservation



## THE UNFINISHED JOB:

*A Look Ahead*  
Page 243

*Conservation Needs*  
Page 245

*Dust Warns Again*  
Page 248

Also—

**SECURITY ON  
JOHNSON CREEK**  
Page 251

SOIL  
CONSERVATION  
SERVICE

U. S. DEPARTMENT  
OF AGRICULTURE



# Soil Conservation

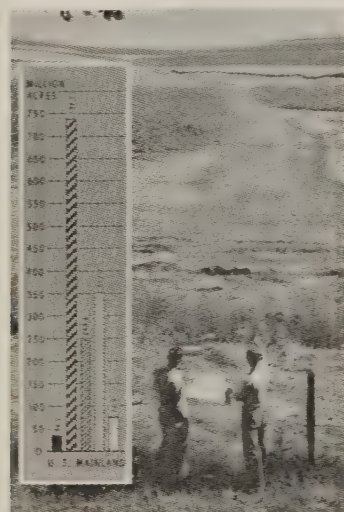
## Unfinished . . .

Seeking someone to comment on the unfinished conservation job detailed by the new Conservation Needs Inventory report (p. 245), we knew we had the answer when we thought of J. C. Dykes.

Few people have been so close to the center of SCS field activity for so long. The battle to curb erosion and improve the use of America's soil and water resources has revolved around his desk from the beginning of his career in the Western Gulf Region in 1935 to its conclusion as deputy administrator for field services of SCS.

Such a background makes his viewpoint on the current resource situation (p. 243) a challenge to all conservationists and responsible citizens.

**Cover:** The bar graph superimposed on the photo of an SCS conservationist talking to a farmer in Pennsylvania represents the extent of the four major conservation "problems" reported by the Conservation Needs Inventory. They are, l. to r. (after the short bar representing "no problems"), erosion hazard, excess water, unfavorable soil, and adverse climate. Being inherent properties of the soil and site, the hazards remain even under proper land use and treatment, and conservationists must continue to plan for fields like that in the photograph.



## CONTENTS

- 243 The Unfinished Job**  
"Stay with it, boys!"  
*By J. C. Dykes*
- 245 Conservation Needs Inventory Shows Dimensions of Job**
- 248 Great Plains Conservation Meets a Regional Problem**  
Dust blows a new warning  
*By Norman A. Berg*
- 251 Security on Johnson Creek**  
Rural community tames waters, revives its economy
- 254 Pampered Stream Responds With Beauty and Utility**
- 255 Sportsman Makes Wildlife Haven**  
*By Robert O. Koerner*
- 256 Soil Display Boards Aid "Know Your Soil" Campaign**
- 257 Taming Wild Wells in Florida**  
District campaign to cap artesian wells  
*By Donald E. Vandergrift*
- 259 Icelandic State Park Uses Watershed Lake**
- 260 District Profile**  
J. Irwin Davis, Georgia
- 262 Review**  
Forage Plant Physiology and Soil-Range Relationships;  
New Publications
- 263 From the Administrator**  
The Challenge of Appalachia
- 264 Great Plains Rancher Prepares for Rain**

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Prepared in the Division of Information, Soil Conservation Service.

BEN O. OSBORN  
Editor

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

GEORGIE A. KELLER  
Editorial Assistant

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Photos available on request.

**Commercial names:** Mention of commercial enterprises or brand names does not constitute endorsement by the Department of Agriculture.

**Subscriptions:** \$1.75 per year, \$2.50 foreign. Single copy, 15 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.



ABOUT 40 DAYS after Congress created the Soil Conservation Service on April 27, 1935, I reported for duty with the new agency. About the time you receive this issue of *Soil Conservation* I will earn my 30-year pin.

Despite the usual custom of oldsters to look back at the work done and to recollect, I am more interested in looking at the soil and water conservation work that lies ahead.

A few weeks ago, Administrator Don Williams told the House Subcommittee on Agricultural Appropriations:

"The soil and water conservation job to date has been adequately accomplished on about a third of the privately owned lands in the country. Very substantial progress has been made on another third, but there remain highly critical erosion, sedimentation, and water management problems in much of rural America as well as in sprawling suburbs and along public thoroughfares that are rapidly being extended throughout rural America."

### Our Prime Concern

It is the *unfinished* third and the *unstarted* third that are of prime concern to me and to all thinking Americans, rural and urban.

Experience dictates, too, that the third where conservation treatment has been "adequately accomplished" also must receive continuing attention.

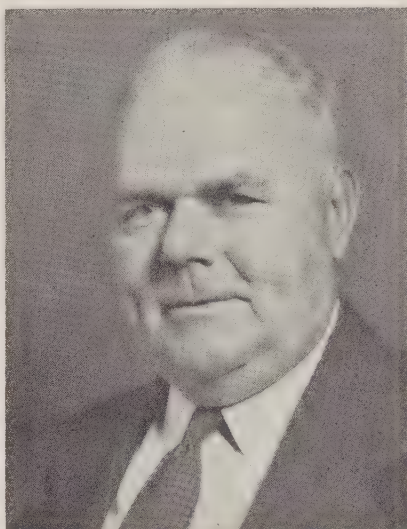
New owners, new technology, and the changing desires for food, fiber, and recreation on the part of our ever-growing population will require repeated changes in land use and treatment on even the third of our privately owned land now regarded as adequately treated.

"Stay with it boys!"

## The Unfinished Job

Conservation is unstarted on a third, incomplete on another third, of land

By J. C. Dykes, Deputy Administrator for Field Services



uation of the data. It is, by far, the best information of its kind that has ever been available to conservation agencies and the general public.

This report deserves the detailed study of anyone seriously concerned about America's soil and water resource base. I will not attempt to review it here, but, in brief, it tells us that nearly two-thirds of the cropland, three-fourths of the non-Federal pasture and range, and more than half the non-Federal woodland is inadequately treated for soil and water conservation.

The Inventory gives an analysis of the land capability of each county, State, and region, and thus defines the potentialities and the limitations for safe land use in each part of the country.

Moreover, it identifies the dominant hazards that must be continuously dealt with in each case—susceptibility to erosion on 51 percent of the non-Federal rural land, unfavorable soil conditions in the root zone on 24 percent, excess water on 17 percent, and adverse climate on 5 percent. Only 3 percent of the land is free of hazards that limit use or require treatment.

Thirty years of travel over all the 48 mainland States has left some very definite impressions of

In other words, the conservation job is never finished.

The final, interpretive report of the National Inventory of Soil and Water Conservation Needs, published just a few weeks ago, points up the problems facing the Soil Conservation Service, cooperating agencies, and the American people.

### Inventory of Needs

The Inventory was a cooperative project within the Department of Agriculture, but many soil conservation district cooperators and local and State representatives of State and Federal agencies participated in the collection and eval-



a few spots where the SCS, districts, and cooperating land owners and operators need to use all their imagination, ingenuity, and conservation tools to achieve conservation objectives.

### Some Trouble Spots

These are some of the trouble spots that challenge the best that conservationists have to offer:

- The great Palouse area in the Northwest, with its deep fertile loess soils from which farmers harvest bountiful crops of wheat and peas, but where the slopes are often steep or long or both, the soil isn't really deep on the upper slopes, and the loess melts like sugar when exposed to melting snow or heavy rains.

- The once great grasslands of southwest Texas, now the victim of that water waster and range ruiner, invading brush.

- The Northern Lake States, covered with low-value woody vegetation and with climate and soils that set the area apart from the Corn Belt with which it is usually lumped.

- The Great Plains, that short-grass country between the true prairies on the east and the Rockies to the West with too much small grain and too little grass.

- Northern New Mexico, with its small farms, inadequate irrigation, and low-income Spanish-American farmers.

- Appalachia, the great Eastern uplift reaching from New York to Alabama, much of it with steep slopes, thin soils, and small, low-income farms.

- The Ozarks, where conditions do not differ greatly from those in Appalachia.

- And those areas near every great metropolitan center where encroaching urban sprawl brings with it special problems for conservationists and soil conservation districts.

The job is well started but it is by no means finished. The areas mentioned above as needing spe-

cial attention only serve to emphasize the need for additional vigorous action.

Congress in its wisdom through the years has seen fit to provide some additional authorities and tools to supplement Public Law 46 that created the Soil Conservation Service. The various watershed acts, the Great Plains Conservation Program, and, just recently, the Appalachian Program, are tools that are being effectively used where they are authorized by law. They could be applied more widely if some of the limitations were removed or additional legislation passed.

The recognition by the Food and Agriculture Act of 1962 that recreation is agricultural use of land may, in the long run, be one of the most important pieces of conservation legislation ever enacted by the Congress. It is certain that income-producing recreation enterprises provide a major new alternative to land owners and operators in deciding how they will use and treat their land.

The same legislation made it possible for the Secretary of Agriculture, through a judicious use of old and new authorities, to initiate a series of pilot Resource Conservation and Development Projects. While it is too early to appraise the results of this effort, the promise is there.

### The Old and New Together

New authorities and tools may be needed and the use of others expanded to make it possible to tackle with any real hope of success the unstarted third of the conservation job. If the need can be clearly shown, this writer believes that the tools will be provided. It will take some doing, but that is not new in the experience of the Service or of districts.

It seems that SCS is remarkably well prepared to hone and improve the old tools and to make excellent use of the new ones.

Service engineers have pioneered

a whole new field of conservation work on the land and in watersheds. Starting with the most meager of guides they have developed the various engineering technologies to a high degree of efficiency.

The SCS took the agronomists out of the classrooms and off the experiment stations and put them to work in fields and pastures of the farms of America.

It moved biologists out of the wildlife refuges onto the private farms and ranches with remarkable results in improving food and cover for wildlife.

It busied foresters with helping millions of small woodland owners with their problems.

It set range men to showing ranchers on privately owned grasslands how to manage their soil, water, and grass for security and profit.

And it enlisted plant materials specialists to find, select, and test plants for use in all the other plant sciences.

### New Kind of Technician

In addition, the Service has developed a new type of technician—the *soil conservationist*, who is part soil scientist, part agronomist, part biologist, part range conservationist, part woodland conservationist, part plant materials specialist, part engineer, part economist, and part farm management specialist—and the rest just plain, dedicated conservationist!

Soil conservationists carry the burden of direct planning and application assistance to land owners and operators on all except the more complex engineering jobs and other measures that require the services of the specialists. Together they will put the old and new tools together to get the work done.

### A Final Word

This old hand is headed for the wagon but does want to repeat a saying that was common in Texas a hundred years ago.



After the Civil War, Texas had no money but a lot of cattle; the North had the money but little meat. It was inevitable that the meat and money would get together.

Enterprising Texas ranchers gathered herds of longhorns from the open range and sent them up the trail to railends in Kansas for shipping north and east. A few ranchers drove their own herds but most of them sent their cattle with professional trail drivers, often with some of their own cowboys as helpers.

Knowing that there would be rivers to swim, long dry drives, storms that might start stampedes, night herding, and Indian troubles, it was mandatory that the cowboys tend strictly to the business at hand. It was usual for an owner to admonish his trail drivers with these words as the herd started north, "*Stay with the cattle, Boys!*"

The conservation road ahead has obstacles to overcome—much more serious than those faced by the Texas cowboy on the trail. It also is much more important that ways be found to solve the conservation problems—important to all the people of this country, urban and rural—so the old hand says, "*Stay with it, Boys!*" ♦

## Conservation Needs Inventory Shows Dimensions of the Job

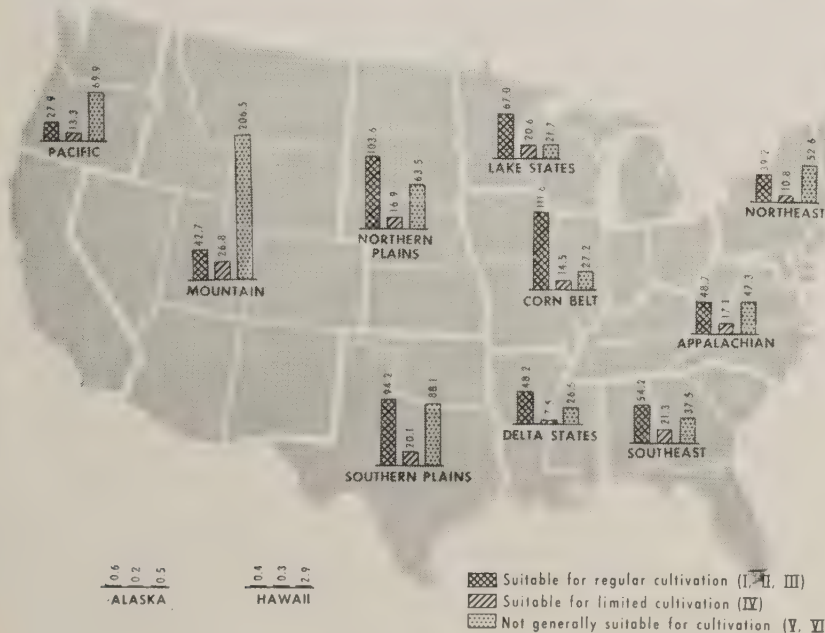
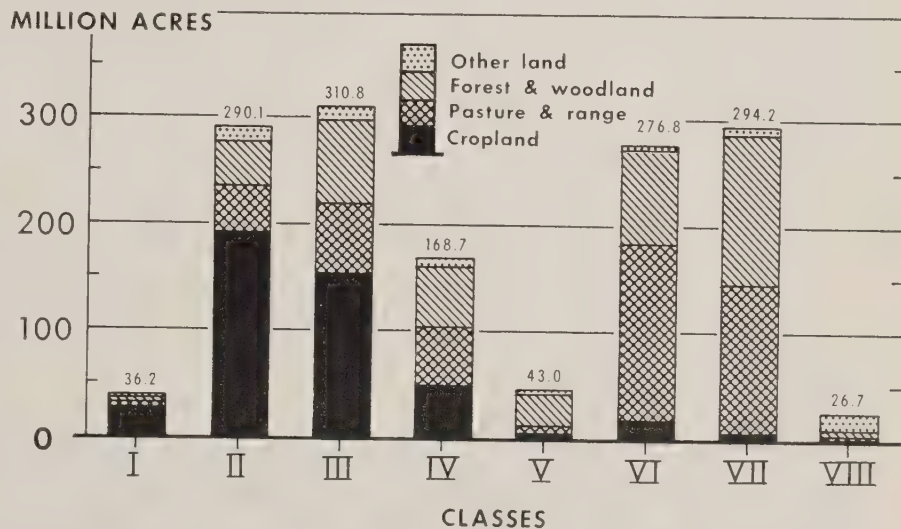
SIX CHARTS reproduced from the final report of the National Inventory of Soil and Water Conservation Needs (USDA Misc. Pub. 971), just published, summarize the major dimensions of the conservation job on the Nation's privately owned rural land.

These charts portray the findings for the 48 mainland States. The national totals are changed only slightly by including Alaska

and Hawaii.

The Inventory covered only the non-Federal rural land, on which the Soil Conservation Service and cooperating USDA agencies have responsibility for national conservation and land use programs.

Estimates of conservation needs for cropland, pasture and range, and woodland are for the acreages expected to be in each land use by 1975.

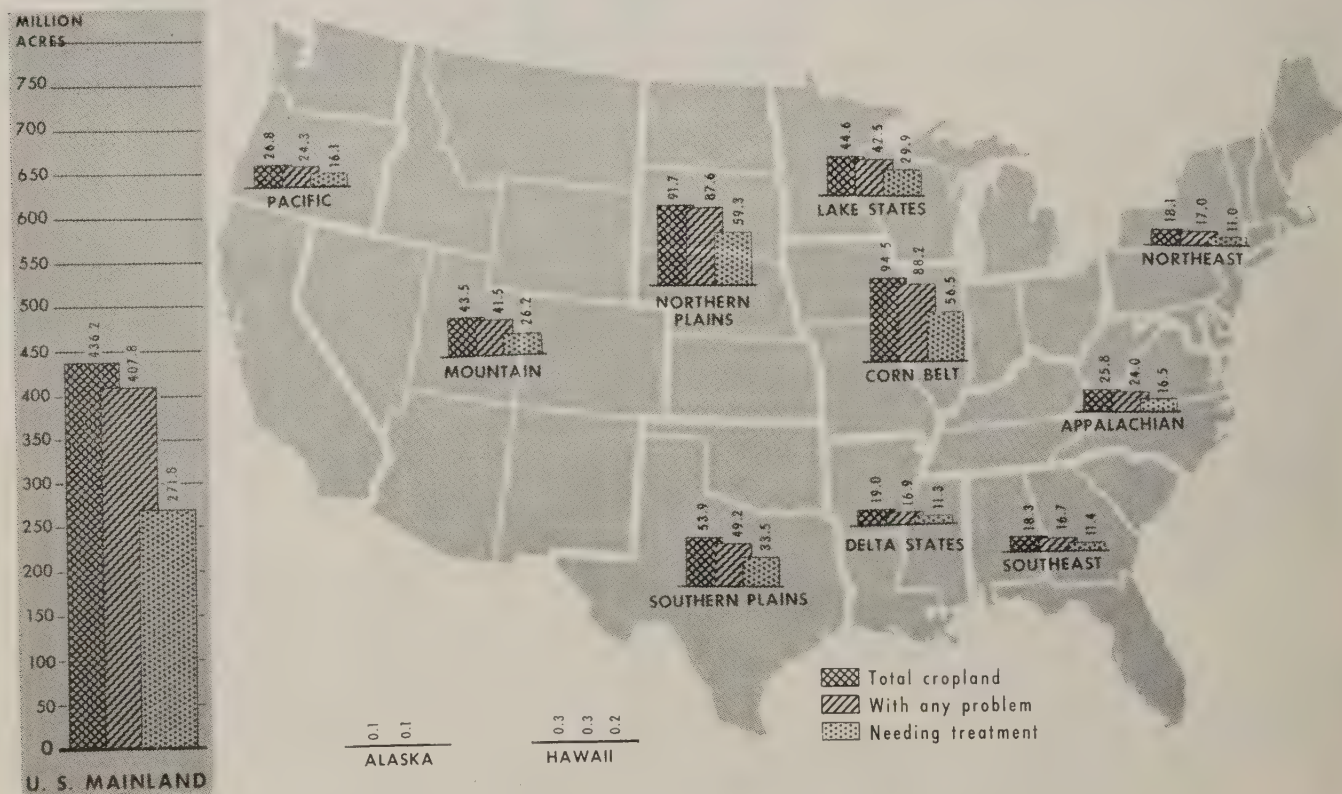




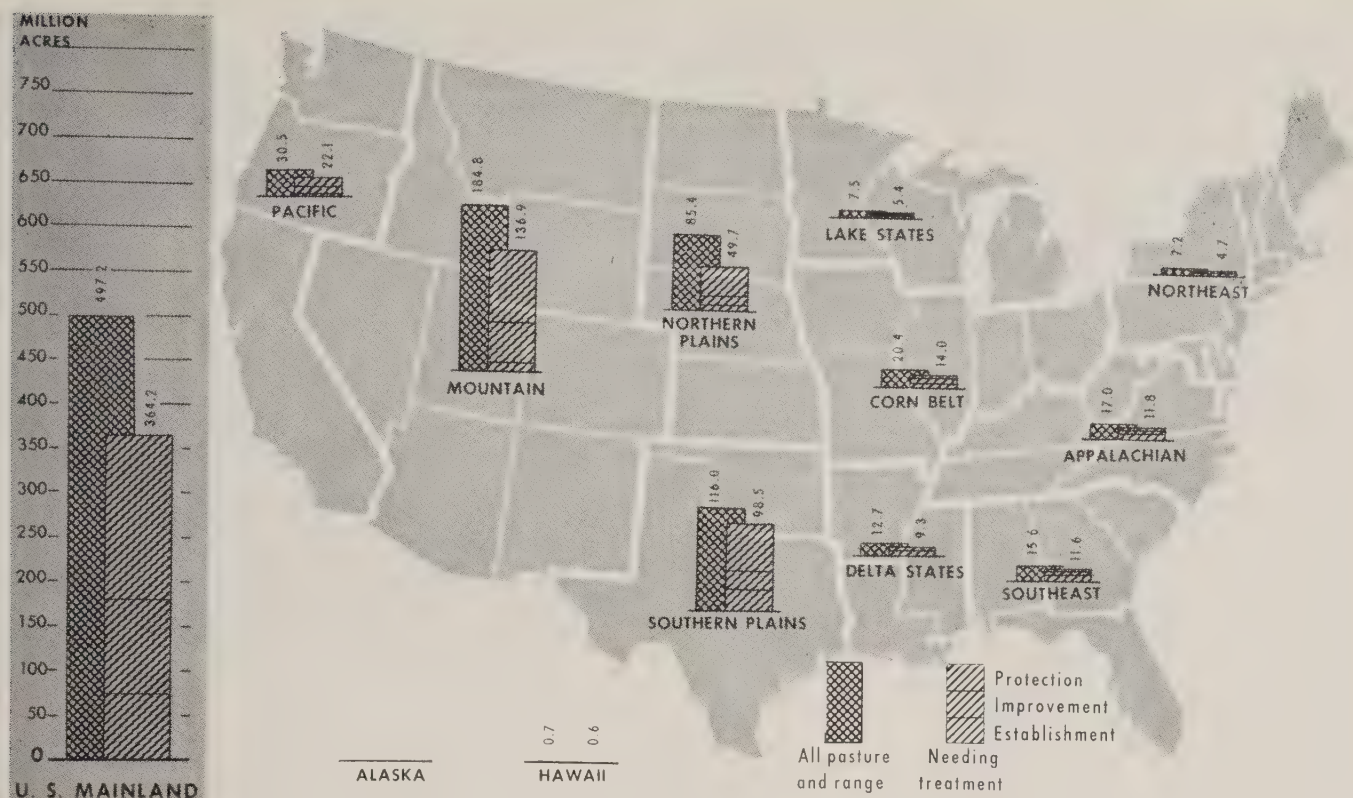


**DOMINANT CONSERVATION PROBLEMS (above).** Dominant problems are identified by the hazards that determine land capability subclass for all non-Federal rural land covered by the Inventory. Class I land, with no problem, amounts to 3 percent.

**CROPLAND NEEDING TREATMENT (below).** Of the 436.2 million acres expected to be in cropland in 1975, 93 percent has some soil conservation problem needing attention, and 62 percent is inadequately treated.

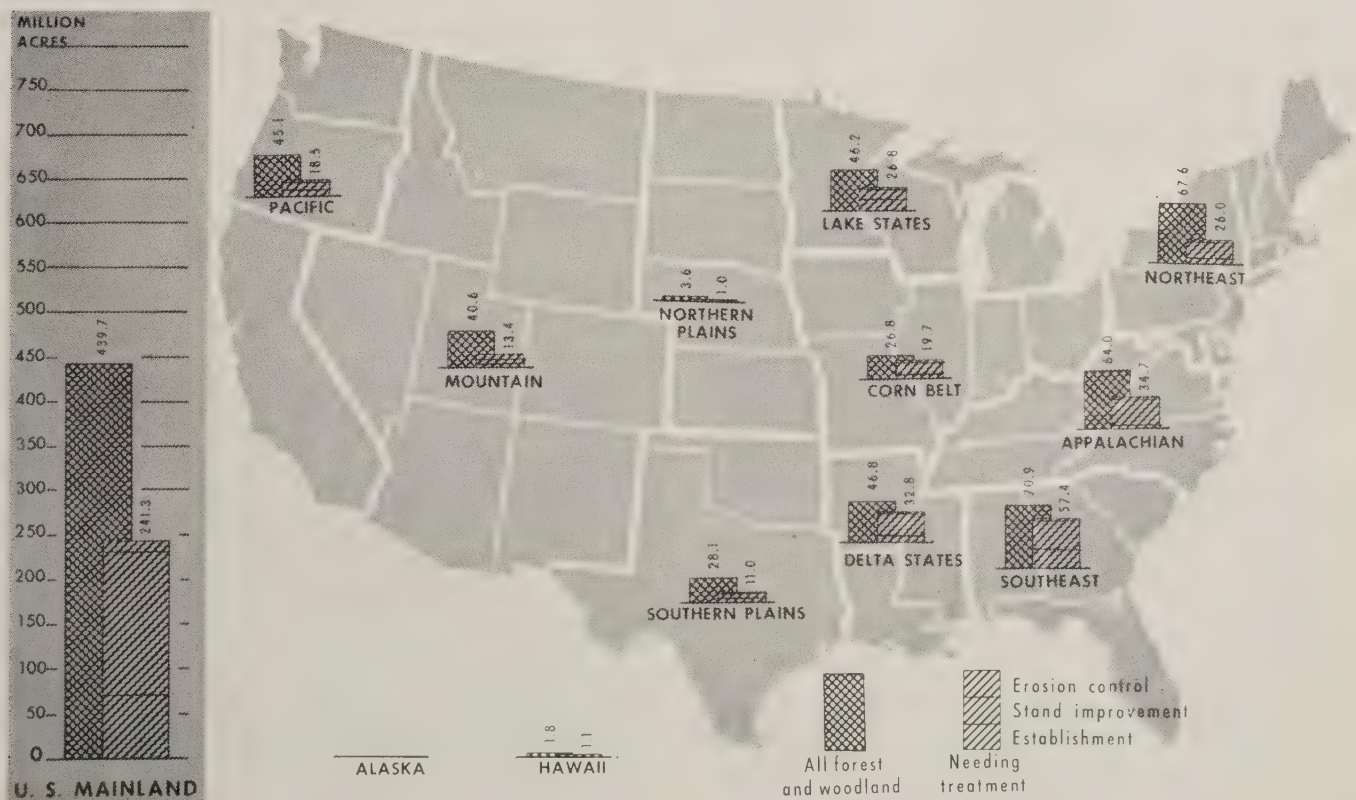






**PASTURE AND RANGE NEEDING TREATMENT (above).** Of 497.2 million acres of non-Federal land expected to be in pasture and range in 1975, a total of 73 percent needs conservation treatment.

**WOODLAND NEEDING TREATMENT (below).** Of 440 million acres of non-Federal land expected to be in forest and woodland in 1975, a total of 55 percent needs conservation treatment.





Dust blows a new warning ....

# Great Plains Conservation Meets a Regional Problem

By Norman A. Berg  
*Assistant to the Administrator*

**I**N THE southern Great Plains again there has been drought and dust—an old story, we have said, with only a few variations in the new script.

The days of blowing dust, with reported land damage up 50 percent from the average of recent years, have set off new and persistent alarms with growing public conjecture as to whether another dust bowl is in the making.

## Worst in a Decade

Late in January, Texas experienced the worst storm in a decade, with winds up to 75 miles an hour. Main highways were closed for hours as blowing dust blocked visibility, and automobile accidents were frequent.

The February wind erosion report of Soil Conservation Service showed 1,864,880 acres damaged

in Texas, a tenfold increase over the 157,670 acres in that State affected at the same date in the previous blow season.

In the 10 Great Plains States as of February 28, wind erosion had damaged 3,142,601 acres, compared to 2,097,437 a year earlier.

The burden of fine dust carried eastward in the atmosphere brought new concern to the people of eastern cities.

In Cincinnati, Ohio, the Air Pollution Control Department estimated that on the 26th of January 140 tons of red dust settled on that city and as much as 1,800 tons on the four-county metropolitan area.

At Robert A. Taft Sanitary Engineering Center there scientists found the dust contaminated with pesticides and other agricultural chemicals that had been used on

Twenty-five years of conservation farming, including a shelterbelt along the edge of the field, has stilled the dust along this stretch of road in the Turtle Mountain Soil Conservation District, North Dakota. The pictures were taken from the same point, the one on the right in 1936.

Soil from the adjoining field fills the borrow pit and clogs the culvert of a road near Cut Bank, Mont.







Headlights were a necessary warning to oncoming motorists at 3:30 p.m. on U.S. Highway 83 near Colby, Kans., during a duststorm in 1956.

the farms where it originated.

Although the amount of chemicals was not enough to be regarded as a health hazard, newspaper reports about them reflected new concern over the menace of wind erosion. The *New York Times* on March 7 editorialized:

### A New Menace

"The loss of this precious topsoil is tragic enough. But the widespread use of pesticides in recent years makes the recent duststorms even more sinister than those of the 1930's."

The public concern recalls the days, now three decades ago, when an aroused Congress, beholding in the Great Plains a vast area of crop failure, blowing land, and human hardship, set in motion a national program of soil conservation.

The Soil Conservation Service was mobilized and soil conservation districts were formed to lend State and local impetus and judgment to the solving of erosion problems.

The prolonged drought that began in the 1950's was worse than that of the 1930's, almost every-

one agreed, in extent, duration, and intensity—worse in every way except in effect.

### Conservation Protects

Farmer know-how, newly developed techniques, better equipment and more of it, plus sounder financing and more effective help from Federal and State sources served to reduce hardship and keep the area's economy going. Individual land owners and operators who were well along with the establishment of soil and water conservation systems on their holdings suffered little damage from the windstorms.

Out of the experience gathered in this and foregoing droughts had come the principles of the Great Plains Conservation Program, combining a complete farm or ranch plan with a cost-sharing contract between each landowner and the Secretary of Agriculture.

As of now, nearly 18,000 land owners and operators have made use of the program and have developed complete conservation plans on more than 38 million acres of crop and range land.

Of the 6½ million acres of crop-

land involved, 1½ million acres has been seeded, or will be, to permanent vegetation—mainly grass. This accounts in 8 years for slightly more than a tenth of the 12 million acres of cropland identified as unsuited to cultivation in the 422-county area designated for the Great Plains Program—substantial progress, indeed, but far short of completing the needed land use adjustment within the authorized 15-year duration of the program.

### Job Still To Be Done

In the larger area of the 10 Great Plains States, the Conservation Needs Inventory showed that nearly 14 million acres of class V to VIII land, physically unsuitable for cultivation, was being used as cropland in 1958. In addition, 22 million acres of borderline class IV land was in hazardous cultivation. Effective control of erosion will not be in sight until all the class V to VIII and much, if not most, of the class IV land is in permanent vegetation.

The Inventory showed, too, that 63 percent of the land likely to remain in cropland to 1975—including soils of class I to III cap-





Grass is the basis of soil and water conservation in the Great Plains, SCS Conservationist Roy Houser explains to Bonnie Runck and her two daughters in an area of former cropland reseeded to grass in the Little Beaver Soil Conservation District, Montana.

able of being safely cultivated with good practices — was inadequately protected for soil and moisture conservation. As in retirement of unsafe cropland to grass, progress is being made in the conservation treatment of the land remaining in cultivation, but the job is far from complete.

Erosion is the dominant problem on 65 percent or 115 million acres of the 178 million acres of cropland still needing treatment in the 10 States.

On the 313 million acres to be in range and pasture by 1975, 240 million acres or 77 percent needs conservation treatment by establishment, improvement, or protection of cover.

### Great Plains Program

A principal objective of the Great Plains Conservation Program as a new tool for SCS in its help to soil conservation districts has been greater speed in conservation. As a pilot program, it was given an authorization of \$150,000,000 in a

period of 15 years with contract writing to end in 1971. Appropriations started at \$10,000,000 a year and have been increased to \$14,864,000 for 1964.

Landowners also make an impressive contribution of their own resources. An analysis of the \$5,000,000 used in cost-sharing in Nebraska showed that the Federal Government has invested an average of \$1,975 in assisting 2,500 landowners. SCS technical assistance was figured at an average cost of \$676. The average landowner's share had been \$1,241, and his loss of income, such as he incurs in changing from cropland to pasture, added \$1,390 to make a total of \$2,631.

So, the landowner's stake about matches that of the United States. For this, we can expect a genuine awareness on his part of the value of conservation and of the need for keeping at it.

Next to establishing permanent vegetation on retired cropland and depleted rangeland, the most wide-

spread practice applied with Great Plains cost-sharing assistance has been the control of brush on more than 2 million acres of range and pasture.

Livestock water developments (more than 5,000), windbreak plantings (13,000 miles), terracing (21,000 miles), sod waterways (11,000 acres), fencing for conservation management of range and pasture (4,000 miles), and the various practices for irrigation improvement — all are important in the Great Plains Conservation Program. These and the other conservation practices are helping to make the Great Plains stable physically and economically.

These are reasons why, although the dust clouds rise high and travel far on the winter and spring winds, we likely will never have another dust bowl such as that of the 1930's. A start has been made — already enough to make a difference — and it has demonstrated that good farming and ranching of the conservation type furnishes cover for vulnerable land that otherwise would give up soil to the winds that are sure to come in season.

We are making progress, and the most important progress is in the attitude of landowners who are thoroughly informed as to the capabilities of their land and plant resources and have determined to use and treat them within those capabilities. ♦

### Grassland Field Day Features Forage Crops

The Second National Grassland Field Day and Conference at Columbia, Tenn., June 23 to 25, will feature the results of experimental work on forage production at the Middle Tennessee Agricultural Experiment Station.

Commercial exhibits will display the latest equipment for grassland farming. The affair is sponsored by the University of Tennessee and American Grassland Council.



# Security on Johnson Creek

*Rural community tames the waters  
and revives its economy through teamwork*

**A** RURAL community in Madison County, Tenn., is rapidly pulling itself out of the category of a depressed area.

D. F. Luckey, area conservationist of the Soil Conservation Service at Jackson, tells how it has all come about since people there got together to promote the Johnson Creek Watershed Project in the mid-fifties.

At that time 125 of the 229 farms in the 22,610-acre project were owned and operated by Negroes. Their average net income was \$519 a year from farms averaging 96 acres in size.

Farming on the steep loess soil on the hillsides was precarious, but they could not use the bottom lands because of frequent floods and standing water. More than 1,000 acres of active gullies poured sand into stream channels and onto fertile bottom land.

As part of the watershed program, several group enterprises were undertaken to improve the standard of living of the cooperating Negro families.

## **A Source of Seed**

One was a seed patch program. Watershed farmers pooled their farm equipment and resources to buy vetch and oats to establish a patch large enough to get a custom combine to come in and harvest seed. The seed was divided among participants and used as winter cover on their individual crop fields.

Another was a tree-planting program. The Madison County Soil Conservation District, a joint sponsor of the Johnson Creek Water-

shed Project, conducted an educational program to get these farmers to sign up for the tree-planting practice under the Agricultural Conservation Program.

The Soil Conservation District Board of Supervisors then borrowed money, interest-free, from the local Production Credit Asso-

ciation to buy pine seedlings which they furnished the farmers.

As soon as the trees were set, the district board paid the participating farmers the remainder of the ACP payment. They were later reimbursed by assignment of these ACP payments.

This program was quite successful. In the first year 150,000 pine seedlings were planted, the second year 300,000.

Besides providing the cooperating farmers money in the winter when they needed it, this program (1) taught the farmers how to participate in the Agricultural Conservation Program, (2) created a desire to treat their gullied areas, and (3) obtained their cooperation in fire prevention.



Billy F. Headden (l.), SCS soil conservationist, helps J. L. Williamson and Robert Monroe in a pine tree planting demonstration early in the Johnson Creek Watershed Project.





A decade ago small rains overloaded the clogged channel of Johnson Creek and sent floodwaters and sediment spreading over the bottom land.

### Conservation Plans

But the road to stability was long and hard, and often discouraging, Conservationist Luckey recalls. To begin with, SCS personnel helped the landowners develop conservation plans. By 1960, 201 of the 229 farms, including almost

all of the Negro farms, were cooperating with the Madison District. They had planted 2,000 acres of trees, mostly on the gullied lands, and were doing other conservation work. Three of the five flood-detention dams were complete and work was to start on another.

Then the cooperators began to see results. Floods were stopped on many areas of bottom land, and farmers began to move their crops from the hillsides. SCS laid out drainage ditches to move standing water from the fields. The Extension Service, the Tennessee Agricultural and Industrial State University, and Tennessee Valley Authority initiated a program to show the Negro farmers how to use fertilizer to build yields on their newly protected fields. The SCS technicians helped them install protective conservation measures on all their land.

### Hunting Area Shared

Another joint endeavor which is of lasting benefit to the whole community was the creation of a recreation and hunting area.

The leading Negro businessmen and farmers incorporated and bought 150 acres. They gave the watershed district a free easement to build a floodwater-retarding



Local labor was used in the watershed project to plant pine trees on more than 1,500 acres of massive gullies like these.





The first Board of Directors of the Johnson Creek Watershed District saw the project approved in 1956 and guided it through the planning and early construction stages. They were (l. to r.) James S. Lawrence, secretary-treasurer and contracting officer; Mrs. Robert Booker, secretary; Fred T. Smith, president; J. L. Collins; B. L. Gilmore; and Crawford Long, vice-president.

structure. They now have a 45-acre lake that is available to the public on a fee basis for fishing, boating, and picnicking.

The Sportsman's Club also got the cooperation of neighboring farmers in planting lespedeza bicolor and other food and cover patches for quail and rabbits. The State Game and Fish Commission cooperated by furnishing planting materials and stocking the area of more than 3,000 acres. After a closed season to allow the game to multiply, the area was opened to the public, without regard to race, for hunting on a fee basis at \$1.25 a day.

The watershed program is now complete. Five flood control structures and 5 miles of channel improvement have virtually eliminated flooding. A 1,650-acre pine forest now exists where formerly there were only gullies. Raw roadbanks have now been covered with bermudagrass.

A feeling of fraternity and accomplishment exists among the people of the watershed. Incomes are on the rise. Many new homes flank the improved roads. Hunt-

ing, fishing, and recreational facilities are available to all.

This is now a safer, more beautiful place to live than when the watershed program was started in 1955. ♦

The new Recreation-Conservation Sticker is now available and sells for \$7. The 1965 sticker is valid from April 1 through March 31, 1966.

It admits its holder and all occupants of his noncommercial auto to national parks, wildlife refuges, national forests, and other Federal recreation areas that charge an admission fee, and covers an unlimited number of visits.

Tickets are sold at all Federal areas subject to entrance fees, and in many cities at offices of the Forest Service and the National Park Service, among others. ♦



Soil Conservationist Frank Richardson checks 8-year-old loblolly pines set under contract in the watershed project.



## Pampered Stream Responds With Beauty and Utility

**W**HEN and if a drop of water ever leaves the Bernbet farm it has all the wetness worn out of it.

Bernbet is owned by Bernard and Betty Biedenharn near Monroe, La., in the D'Arbonne Soil and Water Conservation District. The Biedenharns have been district cooperators for the past 15 years on their 816-acre farm.

Rocky Ford Branch rises out of the ground on Bernbet and is the source of a water supply — and story.

To begin with, the Biedenharns have pampered Rocky Ford Branch and they admit it. They have cleaned out debris that might impede free flow, cleared away undergrowth from the banks, and placed picnic tables along the way. Concrete ramps cross the stream where roads or trails must ford it.

Water for the home is pumped directly from the branch. Every time Mr. Biedenharn has it checked, the laboratory gives it a clean bill. Since he controls the entire watershed, he can keep it that way.

The Biedenharns can push a button, and the sprinkler system in the yard goes to work. Pipes and sprinkler heads are permanent.

Excess water from the house and from the swimming pool in the yard goes back into Rocky Ford Branch downstream. A 22-acre farm pond catches it. The pond has been stocked with fish and is properly managed. Two boathouses, complete with running water, lights, picnic tables, soft drink boxes, and comfortable chairs make fishing almost too easy.

At the upper end of the pond he has installed an electric turbine pump which will deliver 2,000 gallons of water a minute, and this puts water into his irrigation system. Conservationists of the Soil Conservation Service, assisting the D'Arbonne District, helped design



Rocky Ford Branch is a pampered stream throughout its course on Bernbet Farm. Here concrete ramps make an easy ford for one of the farm roads.



Sprinkler irrigation for the home grounds is only one of the ways the stream serves the proprietor of this conservation farm.

and lay out levees, control structures, roadways, and canals to get water to the fields. Each field is fenced with multiflora rose so that birds and animals can find shelter and food.

Years ago Rocky Ford Branch would go on a rampage during heavy rains. But no more; it

doesn't have time. Too busy serving the needs of man and beast, and too much under the fingertip control of a conservationist with a flair for the unusual.—JOHN CROSS AND JIMMIE WYCHE, *Assistant State Soil Conservationist and Area Engineer, SCS, Alexandria and Tallulah, La.* ♦



# Sportsman Makes Wildlife Haven Of His South Dakota Farm

**Robert O. Koerner**

*Work Unit Conservationist, SCS, Onida, S. Dak.*

ON the R. Guy Goddard farm near Onida, S. Dak., wild ducks and geese stay year-round.

The visitor may glimpse a white-tail deer darting into the woods. He may catch sight of a wild turkey or grouse, or spot a golden eagle or great horned owl on patrol.

There are fat bass in the pond. Mink and other kinds of wildlife live nearby.

This is the Goddard farm as its owner has planned it with help from the Soil Conservation Service and the Sully County Soil and Water Conservation District.

## As He Planned It

To him the wild animals and the birds are as important as the successful operation of the farming business. The planting of trees and shrubs, grasses, and other crops, the development of water—all these have been planned and carried on with the well-being of wild things in mind.

Mr. Goddard came by this appreciation of the outdoors naturally. His late father, R. S. Goddard, was widely known as an outdoorsman and soil conservationist.

As a State Representative, the elder Goddard in 1937 helped to put through the legislation that led to the organization of soil conservation districts in South Dakota. The Goddard farm is an example of soil, water, plant, and wildlife conservation closely coordinated for the protection and continuing use of all these resources.

**The deer on the Goddard farm feel at home in the wildlife plantings of shrubs and trees. It's the strange black box that is the intruder!**

In his growing years, Guy Goddard spent many hours with his father tramping the woods, hunting, fishing, and trapping. The two Goddard sons, Steve and Truman,

are treading the same path, eagerly sharing their father's interest in wildlife conservation.

## Wildlife

Many whitetail deer visit the farm from time to time to use the food patches and pond.

Guy Goddard also has a fast-growing flock of Merriam wild turkeys. About a year ago, he purchased 4 of the birds. Now there are about 30, indicating they thrive on the Goddard farm.

There are always eagles and great horned owls around. These





birds normally feed on rodents, and Mr. Goddard is not concerned about the occasional injured bird they may take.

The Goddards had a great horned owl for a pet a while back. It was near a farm building, unable to fly because of a broken wing. The Goddards nursed it, feeding it mostly field mice and rabbits. The bird was wary of the charity, however. It would not touch food while anyone was watching.

A dual purpose pond in one of the pastures attracts many kinds of wildlife. The pond covers 15 acres and is 10 to 12 feet deep. It has become a favorite swimming hole for people in the area. Families often come there for a picnic, and to swim and fish.

Ducks and geese use the pond during migration in the fall and spring. Ducks nest in the uncut grass border around the edge.

The first bass were stocked here in 1953, when the Goddards brought back 31 small bass about 7 inches long from a fishing trip.

The pond is fenced to exclude livestock. Plantings of red cedar and ponderosa pine were made on the contour around the water's edge in 1961, and more in 1962.

A local camera club has made visits to the farm to capture the animals in pictures. Guy Goddard also welcomes individuals and families to his farm who have the same interest in nature that he has. When the trees are big enough, these areas will be ideal for family outings and recreation.

Underplantings of cedar have been made in all of the tree plantings. Trees and shrubs, such as plum, chokeberry, and Russian olive, which are preferred by wildlife, are planted for windbreaks and shelterbelts. To date, more than 20 acres of trees and shrubs have been planted on the farm.

Many birds, such as robins and meadowlarks that normally go south for the winter, stay in the developed wildlife areas on the Goddard farm. Here they are pro-

TECTED from weather and can get grain from the feedlots.

Mr. Goddard was elected president of the Sully County Sports-

men's Club last year. Long active in community affairs, he is also a leading advocate of wildlife conservation. ♦

## Soil Display Boards Aid "Know Your Soil" Campaign

A "Know Your Soil" campaign conducted by supervisors of the Greene County, Ala., Soil Conservation District is attracting wide interest in the county.

Displays of soil profile samples are focal points of the campaign. Display boards are located in the offices of two banks in Eutaw.

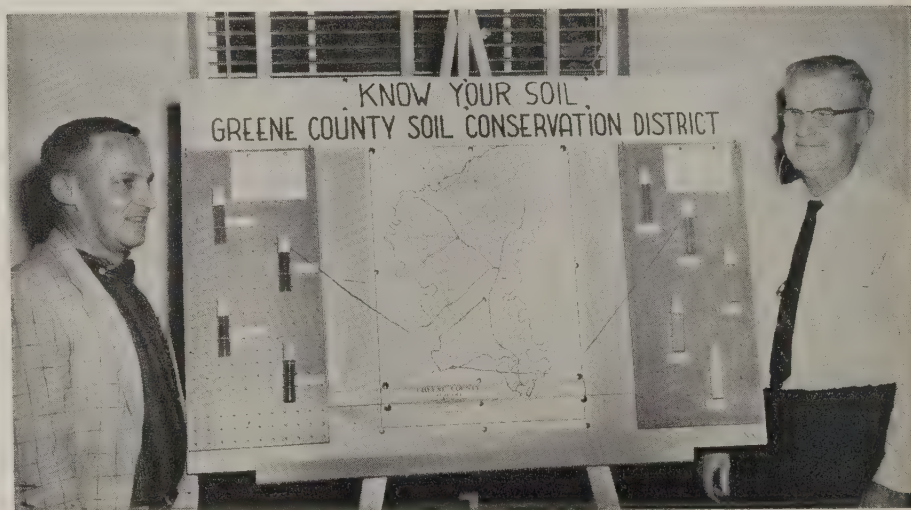
Glass vials are mounted on pegboards placed on either side of a county map. Each vial holds soil taken from one of the farms in the county. The soil samples are being collected by SCS soil scientists in gathering information for county soil survey. Fieldwork for the survey is to be completed in 1965.

A tab by each vial tells the position of the sample in the soil profile, its color and texture. A card on each pegboard gives the name, location, description, potential uses, limitations, hazards, and conservation treatments needed for each soil. A colored string extends from the pegboard to a spot on

the county map where profile samples were taken. The name of the farm is attached to the string.

Bank President E. W. Hood of Merchants and Farmers Bank attributes the continuing interest in the displays to the rotation of the profile samples. "People first find the pins on the map to see if one is in their community, and they know the farm where the samples were taken. Then they study the samples and read the cards carefully."

"Our cooperators, and others, too, have been interested in looking deep into the land," says R. I. Hitt, chairman of the Greene County Soil District. "They are learning the names of our principal soils, why each is suited to—or limited to—certain crops, and why it may require special conservation treatments because of its physical makeup." — LUTHER E. GOWDER AND JAMES A. COTTON, *Work Unit Conservationist and Soil Scientist, SCS, Evergreen and Eutaw, Ala.* ♦



James A. Cotton (l.), SCS soil scientist, and E. W. Hoot, president of Merchants and Farmers Bank, cooperated in the campaign.



# Taming Wild Wells in Florida

**District campaign to cap artesian wells  
halts waste of vital ground water**

By **Donald E. Vandergrift**

*Work Unit Conservationist, SCS, Lake Worth, Fla.*

**F**OR YEARS free-flowing artesian wells have been wasting Florida's underground water reserve that supplies nearly 90 percent of the State's cities and much of its industry and agriculture, despite a 1953 act of the legislature making such uncontrolled flow unlawful.

The Lee Soil Conservation District, by enlisting the cooperation of landowners and public officials, is putting the brakes on such waste in its territory.

The supervisors were concerned not only about the disappearance of a vital natural resource but also about the encroachment of salt water into fresh water fields as underground pressure declined.

Here's how it came about:

## How They Got Started

In April 1964, Chairman Perry A. Nott told his fellow supervisors that the district should take immediate action to halt water waste from uncontrolled artesian wells. Supervisors Charles Wainwright, Andy Nychyk, and Gerald Moody were asked to study the problem and report at the next board meeting.

The committee found that the State Legislature had passed an act in 1953 making it unlawful for artesian wells to flow without control. But little had been done to enforce the law, largely because of a lack of enforcement personnel.

The board then wrote the Division of Water Resources and Conservation, Florida Board of Conservation, about the problem and asked whether the division could provide any assistance.

John W. Wakefield, then division director, assigned H. J. Woodard, division geologist, to assist the district.

At a special meeting of the Board of Supervisors, Mr. Woodard explained the necessary procedures for controlling wells, reviewed the legislation pertaining to the problem, and instructed in the techniques for plugging wells. He indicated that the division would give whatever assistance was necessary in carrying out the well program.

Mr. Woodard estimated that there are approximately 1,000 artesian wells in Lee County, half of them flowing uncontrolled. The uncontrolled flow was estimated at 300,000 gallons of water a day, enough to supply the City of Ft. Myers for 77 days.

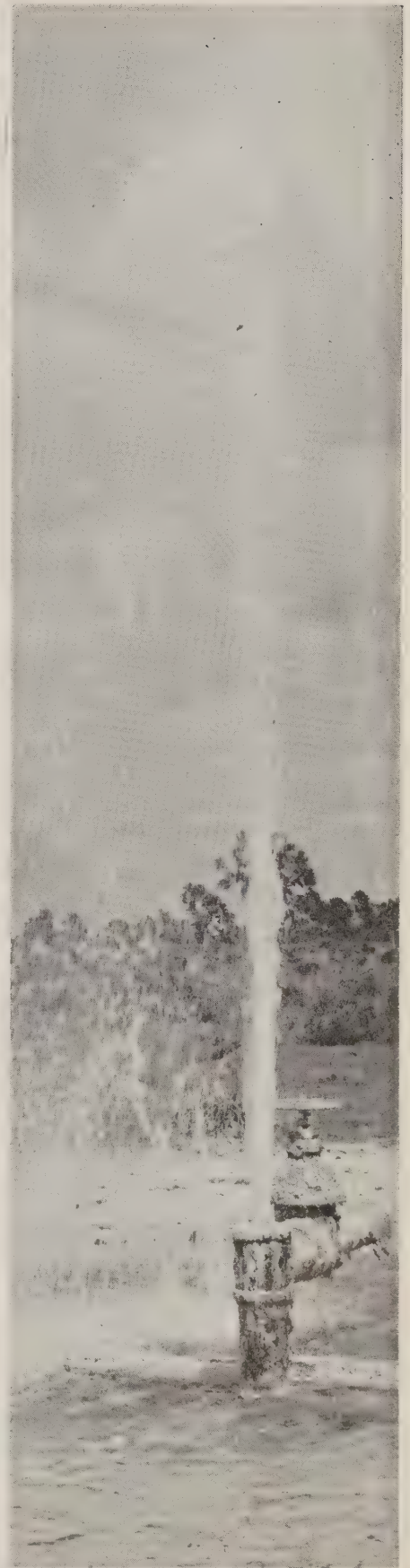
With these facts at hand, the district supervisors went to work. They contacted the local TV and radio stations and newspapers to inform them about the problem and the district's efforts.

## News Media Help, Too

The newspapers gave wholehearted support with articles, editorials, and pictures. TV and radio stations used 1-minute and 30-second spot announcements and interviewed district supervisors on the air.

Residents are asked to report uncontrolled artesian wells to the

**Before the Lee Soil Conservation District got busy on the problem, 500 uncontrolled wells like this one were wasting 300,000 gallons of water every day in Lee County.**





district. The district secretary writes the landowner requesting cooperation by plugging or controlling the well. A copy of the law is attached. A copy of the letter to the landowner is sent to Mr. Woodard's office registering the uncontrolled well with the State Board of Conservation. When 8 or 10 letters reach Mr. Woodard's office a trip is scheduled to Lee County to check the wells. Usually he finds that 80 percent of the reported wells already have been brought under control.

The Lee District has received many plaudits on its successful program to curtail water waste, including letters from landowners who have controlled wild wells.

### SCD Program Commended

Charles Flint, president of Lee County Cattlemen's Association, said; "Water conservation is of vital importance to the cattleman. The cattlemen of Lee County are very appreciative of the efforts of the district supervisors in trying to curb the waste of water . . . . This is a very important step toward the conservation of our water supply."

Julian Hudson, chairman of the Lee County Board of Commissioners, stated that "bringing these wild artesian wells under control is way past due."

L. A. Jacobsen, SCS area conservationist at Sebring, terms this program as one of the four outstanding conservation accomplishments in south Florida since 1960.

Other conservation districts in Florida are planning similar programs. ♦

## Arkansas Broadens District Powers

**T**HE FIRST State to enact a soil conservation districts law is again in the lead in modernizing its districts' functions to deal with a wide range of resource problems.

The Arkansas legislature has just amended its enabling act to broaden the purposes of districts and give them necessary powers to sponsor and finance structural measures and other features of conservation projects.

The 1965 amendment extends the purposes and powers of districts to include "the control and prevention of soil erosion, and for the prevention of floodwater and sediment damages, and for furthering the conservation, development, and utilization of soil and water resources and the disposal of water." The original act provided only for "the conservation of the soil and soil resources of the State, and for the control and prevention of soil erosion."

The amendment also authorizes a soil and water conservation district to plan, carry out, operate, and maintain developments in "improvement project areas," such as small watersheds under Public Law 566, without the necessity of forming additional local governmental units.

The districts now have the authority to use the right of eminent

domain in acquiring the necessary rights-of-way, and of taxation, selling bonds, and borrowing money to finance local project expenditures.

This permits soil and water conservation districts, as well as watershed improvement districts or subdistricts of drainage districts, to sponsor watershed projects and execute construction contracts.

Soil conservation leaders in Arkansas believe the strengthened role of conservation districts will facilitate the application of land treatment and structural measures in the proper sequence and will insure effective maintenance. ♦

### 4-H Club Wins State Conservation Awards

Resource pooling 9 years ago created New Jersey's first 4-H Soil, Water, and Wildlife Conservation Club. Now thriving, the club has much to show for its conservation work.

At the start James Rice, 4-H Club agent, and Harry R. Slayback, Soil Conservation Service, provided the impetus. Slayback developed a conservation plan for the club. Mercer County Soil Conservation District Supervisors set up a system of awards for outstanding conservation achievements. Phil Alampi, State Secretary of Agriculture, gave the club the use of his 142-acre farm and equipment.

Guided by Jack Klein, 4-H Club leader, and David Tindall, SCS technician, members have planted more than 11 acres of wildlife food patches in contour strips. They have also planted trees and shrubs for wildlife and built and placed wood duck boxes in trees. Twice a year they count the increasing game on the entire farm. Other conservation work is being carried out.

Two members, Donald Fenton and Charles Appelget, have won State 4-H Club awards. ♦



Water waste is being reduced by installation of valves such as this one being checked by Perry A. Nott, Lee SCD board chairman.



## Icelandic State Park Makes Good Use of Watershed Lake

IN North Dakota's northeastern corner, Icelandic State Park — near enough to the border to beckon the Canadian neighbors — has become a recreation mecca for increasing thousands of visitors each year.

The park's center of attraction is Renwick Dam and Reservoir — a part of the Tongue River Pilot Watershed Project. The lake last summer offered swimming, water skiing, boating, and fishing. Now fitted with boat docks and several areas for picnicking, a swimming beach for the lake is scheduled for next summer.

Skirting the reservoir is Cavalier's municipal golf course with an arm of the lake providing a water hazard for the 9th hole.

In addition to recreation, the dam provides flood protection and stores municipal water for nearby Cavalier.

Several organizations contributed to the project: The Pembina County Water Management District, the North Dakota Game and Fish Department, and the City of Cavalier paid the local costs for building the dam. The Soil Conservation Service provided the Federal funds and technical help.

To create the park, the water management district first transferred to the State 500 acres adjacent to the reservoir. Then G. R. Gunlogson, a descendant of a pioneer family in the area and now an industrialist in Racine, Wis., donated 200 acres. These 200 acres will be developed as an arboretum.

The park is a memorial to pioneers, many from Iceland, who peopled the area in its settlement days. There is talk of a pageant, depicting the history of the area and recognizing the Icelandic culture, to be presented in the park next season.

And as Mr. Gunlogson phrased it at the dedication last summer:

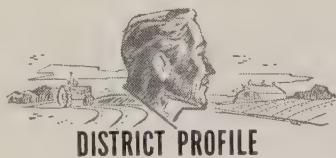
"Leisure is coming faster than people are able to use it. The business of recreation is the biggest in

the country."—ARTHUR H. CRATY, *Assistant State Conservationist, SCS, Bismarck, N. Dak.* ♦



Renwick Dam and its lake have become a popular recreation center. It represents the varied uses of resources in upstream watersheds. The stream fed by the outflow is a favorite spot for anglers.





J. Irwin Davis

Georgia

## He Showed Them How

**“W**HO COULD forget Jeff? When he showed us how to use that power equipment on the farm in Dooley County (Ga.) and talked to us, he made it look and sound so easy, we just had to try it . . . and you know he was right . . . and I’ll never forget that joke he told.”

That’s the kind of answer you get when you ask almost any farmer, farm contractor, or farm equipment dealer in the Southeast if he knows Jeff Davis of Albany, Ga.

For more than a half century J. Irwin Davis has made major contributions to the advancement of agriculture—and especially to soil and water conservation—in the South. After receiving a B.S. degree in agriculture from the University of Georgia in 1914, he

worked as county agent in Brooks, Decatur, and Dougherty counties. In April 1929, he began a career with the Caterpillar Tractor Company of Peoria, Ill., that lasted until 1958 when he reached retirement age.

### Outstanding Service

In 1958, the Georgia Association of Soil Conservation District Supervisors awarded Jeff Davis a plaque for “outstanding service in promoting the Soil Conservation District Program.”

Although promoted and honored by his company and offered higher positions elsewhere, he never left his home at Albany.

Jeff Davis was a leader in developing the terracing program in the middle 1930’s and in promoting

woodland conservation in Georgia, Florida, and south Alabama.

In 1946, his company assigned him to the development of special equipment for land clearing for pasture and reforestation. He worked closely with colleges and experiment stations to learn the need for special tools and with auxiliary manufacturers to get them made.

### Watershed Construction

Beginning in 1954 he cooperated closely with the Soil Conservation Service and soil conservation districts in promoting the small watershed program. He aided construction work by arranging and conducting demonstrations of the use of heavy equipment for clearing reservoir sites. He helped contractors see their opportunities in watershed construction work and maintained for their information a file of the status of projects in his territory.

From 1955 through 1958 Mr. Davis worked with the Southern Piedmont Soil and Water Conservation Experiment Station at Watkinsville, Ga., and the SCS in developing methods of building parallel terraces with heavy equipment. He and L. D. Worley, SCS State conservation engineer in Georgia, worked out many of the problems together on cooperators’ farms.

In mid-1956 Mr. Davis and John Carreker, then superintendent of the experiment station, did exploratory research on combining the principles of landforming with terrace construction on rolling land. These tests were followed by further work on a field near Monroe, Ga., made available by Deere



J. Irwin (Jeff) Davis sees his face reflected from a plaque presented by the Georgia Association of Soil Conservation District Supervisors.





In 1934, Jeff Davis (r.) and Fletcher Farrington, then county agent of Tallapoosa County, Ala., stood on a broad-base terrace in one of the first fields terraced in the county.

Acres, a test farm of the John Deere Plow Company.

Mr. Davis said that in developing the idea of parallel terracing with the tractor-scraper, "we decided to forget the old spacing criteria and figure on a terrace interval which would work with four-row planting and cultivating equipment and with six-row dust-ers and sprayers. . ."

### Parallel Terraces

In February 1957, Jeff Davis helped to demonstrate this method of parallel terracing on the farm of Ralph Burton in Dooly County, Ga., near Vienna. The demonstration was sponsored by the Ocmulgee Soil and Water Conservation District in cooperation with the SCS. The Caterpillar dealer for south Georgia provided the equipment. Soon afterward, Mr. Davis helped put on a parallel terracing and landforming demonstration sponsored by the Richland County District near Columbia, S.C.

Many similar demonstrations fol-

lowed in the Southeast. More than 60 have been held in Georgia. In Dooly County alone, 287 miles of parallel terraces and 104 acres of grassed waterways, not including hay land, have been established.

After Mr. Davis retired from the Caterpillar Company he could not "stay out of harness" more than a few days. He went to work with the Rome Plow Company of Cedartown, Ga., as consultant and later as manager of sales promotion. He was active in developing new methods in reforestation and the use of heavy equipment in agriculture and forestry.

Finally, in February 1963, at age 70, Jeff Davis fully retired. However, he is still subject to call by the plow company for consultation or assistance on specific problems.

In June 1964, Mr. Davis and his wife, the former Lois Fleming of Athens, celebrated their golden wedding anniversary. They have three sons and six grandchildren. ♦

## Water Spreading Gives Rancher Use of Rainfall

(Picture on back page)

"WE HAVE to be prepared to make the best use of water when it comes!"

This is the view of Lonnie Adams who ranches near Roy, Mont., in the Fergus County Soil Conservation District. He is one of the central Montana ranchers who are developing about 2,000 acres annually of floodwater spreading systems with the help of the Soil Conservation Service and the Great Plains Conservation Program.

Mr. Adams completed a dike system last year on about 185 acres on Big Bear Creek and released water in late August from a storage dam to flood the area.

After the dikes were completed they were seeded to native western wheatgrass. The flooding helped get the grass growing and a good cover was established in the fall on the disturbed areas.

Mr. Adams had the water-spreading development in mind when he bought the 11,000-acre ranch a few years ago. He also manages the 60,000-acre L. L. Armour ranch near Forsyth where flood irrigation systems have been developed on more than 600 acres of bottom land.

The flooded areas at the Forsyth ranch have come back to western wheatgrass, replacing the big sagebrush and greasewood naturally present. The grass is used primarily as hay for winter feed.

After buying the ranch near Roy, Lonnie Adams, with the help of SCS Conservationist Pete Haverkamp, planned to develop about 1,040 acres of water spreading on Box Elder Creek and Big Bear Creek flood plains. They also planned a deep artesian well and stock-water dams to provide water for better livestock distribution on the ranch.

The 1,040 acres to be flood irrigated will depend on spring runoff and heavy summer storms. The drainage area above the development is large enough to flood the area about 4 out of every 5 years, according to the SCS conservationists assisting with the plans. The Adams ranch has the added insurance of large reservoirs that can store water for part of the system for periods of poor rainfall. — CLAYTON OGLE, Area Conservationist, SCS, Lewistown, Mont. ♦

### Soil Surveys

A soil survey serves a great many other purposes besides those required by agriculture. Soil surveys are also used by engineers, urban planners, land appraisers, and others. In recent years the engineering interpretation has become especially important to State highway departments and others. ♦





**Forage Plant Physiology and Soil-Range Relationships.** 1964. *American Society of Agronomy, ASA Spec. Pub. 5.* Madison, Wis. 250 pp., illus. \$2.50.

Papers of two symposia sponsored by the Crop Science Society of America, the Soil Science Society of America, and the American Society of Range Management presented November 17-21, 1963, at Denver, Colo., are included in this publication.

Principles of plant growth and response to environmental factors are discussed by authorities from several fields of research and experience.

Perhaps no type of information is more important to sound conservation than that presented in this one volume. Soil scientists, range conservationists, agronomists, and all conservationists should become familiar with it.

Of special significance to the developing concepts of soil and range site classification are papers by SCS men Andrew R. Aandahl and Arnold Heerwagen on survey concepts; H. B. Passey, W. K. Hugie, and E. W. Williams on an example of pristine range and another on herbage production; Gerald L. Richard and George V. Davis on High Plains range; and Richard R. Covell and William A. Cole on Coastal Plain range.—R. E. WILLIAMS, *Resource Development Division*.

## New Publications

**World Population and Food Supplies, 1980.** 1965. *American Society of Agronomy.* Madison, Wis. *ASA Spec. Pub. 6.* 50 pp. Single copies free. A symposium presented at the 1964 meeting of ASA. The following paragraph from the foreword by L. A. Richards, ASA president, summarizes the contents:

"The authors of the four papers in this publication give authoritative information of food and population for

the next 15 years, during which period it appears that the world's per capita food supply will be reasonably adequate, if satisfactory distribution can be accomplished. But, already, food exporting nations are developing resistance to food shipments on a subsidized basis. Unless birth rates decrease within the relatively near future, food requirements will exceed the most optimistic estimates of production capacity and population will be stabilized by increased death rates arising from natural causes that are historically known."

**Reestablishment and Use of Grass in the Morton County, Kansas, Land Utilization Project.** BY C. M. SCHUMACHER AND M. D. ATKINS. 1965. *USDA SCS-TP-146.* 16 pp., illus. This technical paper reports the results of land stabilization and grass reestablishment, management, and use in the project. Work was undertaken when wind erosion was a critical problem and no seed and little information were available on how to reestablish grass.

The results demonstrate that (1) cropland and denuded rangeland can be successfully reestablished in native range grasses, (2) forage sorghum or broomcorn is the most effective crop in initial stabilization, (3) a specially designed grass drill is the best tool to use, and (4) only seed of local origin or proved adaptation to the locality and site can perform well in permanent rangeland seeding.

**An Economic Survey of the Appalachian Region, With Special Reference to Agriculture.** BY R. I. COLTRANE AND E. L. BAUM. 1965. *USDA Agr. Econ. Rpt. 69.* 78 pp. A report, supported by 70 tables, on the agricultural problems and opportunities, with special emphasis on the employment trends, in 322 counties in Pennsylvania, Maryland, West Virginia, Kentucky, Virginia, Tennessee, North Carolina, Georgia, and Alabama.

**How the United States Improved its Agriculture.** BY RAYMOND P. CHRISTENSEN, WILLIAM E. HENDRIX, AND ROBERT D. STEVENS. 1964. *USDA Econ. Res. Serv., ERS Foreign-76.* 32 pp. Text and charts analyze the factors contributing to the amazing increase in U.S. agricultural productivity in the past century. Although conservation technology as such is obscured by the economic viewpoint of the analysis, the report contains much information of interest to people concerned with resource use and development.

**Soils of India.** BY S. P. RAYCHAUDHURI, R. R. AGARWAL, N. R. DATTA BISWAS, S. P. GUPTA, AND P. K. THOMAS. 1963. *Indian Council of Agricultural Research.* New Delhi. 496 pp., maps. "Soil is the most important natural resource of the country and an intimate knowledge of this is a pre-requisite in any national development plan" says the opening sentence of the preface. This report purports to bring up to date all the data collected on the subject up to 1960.

**Time, Space and Demand for Natural Resources.** *Proceedings of the Nineteenth Annual Meeting, Soil Conservation Society of America, Jackson, Miss., 1964.* SCSA, Ankeny, Ohio. 226 pp., appendix 41 pp.; mimeo. \$5.00. Copies of the papers, reports of committees and officials, and accounts of tours at the meeting.

**Soil and Water Conservation Research in the Northeastern States.** BY CLARENCE S. BRITT. 1965. *USDA Misc. Pub. 984.* 24 pp., illus. A description of sedimentation, hydrologic, hydraulic, irrigation, brackish water, drainage, water and wind erosion, soil management, soil, and water and plant relations research.

**Water Resources Research. Vol. 1, No. 1. First Quarter, 1965.** Published by the American Geophysical Union, Washington, D.C. 145 pp., illus. \$6.00 a year (\$3.00 to members), \$2.50 a copy. Walter B. Langbein and Allen V. Kneese, editors. Open to "original scientific contributions in the sciences of water."

**The Demand and Price Situation for Forest Products 1964.** BY DWIGHT HAIR AND ALICE H. ULRICH. 1964. *USDA Misc. Pub. 983.* 50 pp., tables, charts. Current trends and the long-range outlook for timber products.

**Guide for Assessing Recreation Possibilities on Private Land.** BY FEDERAL EXTENSION SERVICE. 1964. *USDA PA-642.* The foldout leaflet includes a form for analyzing your prospects for success with an income-producing recreation enterprise on your property.

**The Pilot Cropland Conversion Program, Accomplishments in its First Year, 1963.** BY JAMES VERMEER AND RONALD O. AINES. 1964. *USDA, Agr. Econ. Rpt. 64.* 47 pp. A statistical report.

**Budgeting Farm and Ranch Recreation Enterprises.** BY GLENN J. VOLLMAR. 1964. *USDA ESC-559.* 15 pp. A guide for budgeting as a pre-planning step in recreation enterprises. ♦



From the Administrator:

## *The Challenge of Appalachia*

APPALACHIA is not a new problem area to the Soil Conservation Service. For years we have recognized the peculiar needs of this region and have taken some specific actions to try to meet them.

SCS programs are particularly adapted to many of Appalachia's basic resource development needs. The people generally are receptive to these programs. How, then, will the Appalachian Regional Development Act of 1965 help the people take further advantage of programs administered by SCS?

Let us first examine the concept of the Appalachian Regional Development Program.

The Conference of Appalachian Governors, composed of the governors of the States in which the region lies, requested the Federal Government to assist them with a program that would help the people to help themselves.

Such a program would require an improvement of the economic base if sustained benefits were to be realized. It was necessary, therefore, to analyze the needs and potentials of the region as a basis for program development.

SCS participated in that study and in the development of those aspects of the program involving soil and water conservation and water resource development.

Early in 1964 the President's Appalachian Regional Commission submitted its report. It defined the needs of the region and provided the basis for legislation which was enacted March 9, 1965, as Public Law 89-4.

Of the many provisions of the act, there are only two under which SCS has direct cooperative responsibilities. These are "land stabilization, conservation, and erosion control" (Sec. 203) and "water resource survey" (Sec.

206). Strip mine area rehabilitation may also become of direct interest as the program develops.

At the same time, we have a challenging opportunity to accelerate the watershed program already under way in the area. If the States and local people cooperate to increase this program, it could provide a great stimulus to rural communities in Appalachia.

Section 203 authorizes the Secretary of Agriculture "... to enter into agreements of not more than ten years with land owners, operators, and occupiers ... providing for land stabilization, erosion and sediment control, and reclamation through changes in land use, and conservation treatment including the establishment of practices and measures for the conservation and development of soil, water, woodland, wildlife, and recreation purposes."

This provision introduces into the Appalachian Program contract provisions similar to those of the Great Plains Conservation Program. It will permit land owners and operators to make long-term conservation and development plans for their farms and assure them cost-sharing up to 80 percent of the cost of establishing the agreed-upon measures on not to exceed 50 acres.

I feel that these provisions of the act should provide a significant degree of acceleration to soil conservation district operations. Under the authorities of our conservation operations program we will provide increased technical assistance to meet the larger workload. SCS will also establish a plant materials center to more adequately serve the region.

The water resource survey under Section 206 will be carried out under the direction of the Secre-

tary of the Army. SCS will cooperate with the Army and other agencies in about the same way as in the present river basin surveys.

Our activities under this section will supplement studies already under way or completed.

There is a great need and opportunity to accelerate water resource developments. We expect to speed up both planning and operations phases of Public Law 566 watershed activities.

There is already a significant backlog of applications for assistance in watershed projects. But applications do not tell the whole story. Some States have needs far in excess of those reflected by active applications on file.

One of the big obstacles to installation of approved plans has been the inability of the sponsors to meet their obligations for easements and rights-of-ways. Section 214 provides for "supplements to grant-in-aid programs," including watershed protection programs. An analysis of approved projects indicates that approximately 75 percent of the Appalachian watershed projects would be eligible for some assistance under this section. This section may offer an excellent opportunity to overcome specific obstacles in some projects.

The Appalachian Regional Development Act provides a unique arrangement for joint Federal and State attack on social and economic problems of a region. The success of the program will depend on how effectively Federal and State efforts can be coordinated in this endeavor.

The potential impact of this program on the regional and National economy challenges an "all out" effort at all levels to make it work.

—D. A. WILLIAMS



If your address changes, please notify us of your complete new address, including Zip Code number, and include old address with our code number as shown above.

## Great Plains Rancher Prepares for Rain

Story on p. 261



Rancher Lonnie Adams (l.) and SCS Conservationist Clayton Ogle are pleased with the first flooding of a new water-spreading system.

The dikes are at 6-inch vertical intervals on the flood plain, so water released from a storage reservoir gives

the entire area a good soaking.

Western wheatgrass covered the bare areas, and Rancher Adams harvested hay for use as winter feed. The system is part of a completed conservation plan under the Great Plains Conservation Program.



35

U. S. DEPT. OF AGRICULTURE  
NATIONAL AGRICULTURAL LIBRARY

JUL 6 - 1965

CURRENT SERIAL RECORDS

JULY 1965  
VOL. XXX, NO. 12

# Soil Conservation



## A LOOK AT APPALACHIA:

<i>Its Problems</i>	Page 268
<i>The Program</i>	Page 270
<i>In Perspective</i>	Page 271

## Also—

URBAN SOIL EROSION	Page 274
A RECREATION FARM	Page 276

SOIL  
CONSERVATION  
SERVICE

U. S. DEPARTMENT  
OF AGRICULTURE



# Soil Conservation

## *Regional . . .*

"Each acre according to its needs and capabilities" has been the tenet of conservation planning since the first days of SCS.

As planning horizons broadened from the separate fields of individual farms to entire watersheds and larger areas, the principle of fitting every plan to a specific area has continued to be our guide.

First, the Great Plains Conservation Program, and now the Appalachian Regional Development Act, extend this principle to broad governmental action aimed at unique regional problems.

For an insight into the character of the land and people of Appalachia, we asked veteran conservationists to give us local viewpoints on problems (p. 268), resource programs (p. 270), and historical background (p. 271).

**Urban Erosion:** A major part of the unfinished conservation job that Deputy Administrator Dykes challenged us with in the June issue of *Soil Conservation* is the critical erosion occurring in urban and suburban areas. Out of first-hand experience in the Washington and Baltimore metropolitan areas, Conservationist Verne Bathurst appraises (p. 274) this new menace of soil erosion.

**Cover:** Conservation practices on the watershed of Muddy Creek in York County SCD, Pa., cleared the stream sufficiently for the Fish Commission to stock it for the first time in 1957.



## CONTENTS

- 267 **A Look at Appalachia**
- 268 **Its problems**  
*By Robert H. Marcum*
- 270 **The program**  
*By Robert W. Oertel*
- 271 **In perspective**  
*By Glendon P. Burton and Ross Mellinger*
- 274 **Soil Erosion in Urban Areas**  
Old problem takes a new form  
*By Verne M. Bathurst*
- 276 **Maryland Urban Farm Thrives on Double Duty Land Use**
- 279 **Grazing Native Grass Proves Conservation Use of Marsh**  
*By Thomas N. Shiflet*
- 280 **Contractors Help Speed Woodland Improvement**  
*By Paul A. Dodd*
- 281 **Conservation Design Tames Old Cataract Ditch**  
*By Neal McKinstry*
- 283 **Tennessee Community School Studies Conservation**  
*By E. B. Dyer, Jr.*
- 286 **Review**  
The Economic Demand for Irrigated Acreage; New Publications
- 287 **From the Administrator**  
The Cost of Sediment
- 288 **Recreation and Livestock Make a Happy Combination**

SOIL CONSERVATION is the official organ of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication was approved by the Bureau of the Budget, July 25, 1963.

ORVILLE L. FREEMAN  
JOHN A. BAKER  
DONALD A. WILLIAMS

Secretary of Agriculture  
Assistant Secretary of Agriculture  
Administrator, Soil Conservation Service

Prepared in the Division of Information, Soil Conservation Service.

BEN O. OSBORNE  
Editor

GEORGIE A. KELLER  
Editorial Assistant

**Reprint permission:** Contents of this magazine may be reprinted without special permission. Credit is not required but is appreciated. Photos available on request.

**Commercial names:** Mention of commercial enterprises or brand names does not constitute endorsement by the Department of Agriculture.

**Subscriptions:** \$1.75 per year, \$2.50 foreign. Single copy, 15 cents. Discount of 25 percent on orders of 100 or more sent to same address. Order direct from Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.



# A Look at Appalachia

## Another special regional plan for resources

**A**S THE newly formed Appalachian Regional Commission forges ahead in implementing the Appalachian Regional Development Act of 1965, the Soil Conservation Service, like other Federal agencies, is reexamining its programs and activities to mesh them with the total effort for economic betterment of the region.

Soil conservation districts, as local units of government responsible for resource conservation and development, also are reviewing their programs in the light of new goals and new sources of outside assistance.

The districts will join with State agencies in making plans to use the provisions of the act to local advantage. The Commission, composed of the 11 Governors or their designees and a Federal co-chairman, is the general planning and coordinating body.

SCS has unique experience in administering a regional resource conservation and development program. The Great Plains Conservation Program, initiated in 1957, set a precedent for the regional approach to alleviating unique regional resource problems. Soil conservation districts in the Plains provided effective local leadership in that program.

In the following pages, key SCS conservationists in three States provide a firsthand look at the peculiar conditions, problems, and aspirations of Appalachia that make a parallel regional program appropriate for another distinctive part of the country.





# Its Problems

**Eastern Kentucky's abused resources  
hold promise of economic development**

**By Robert H. Marcum**

*Area Conservationist, SCS, Hazard, Ky.*

**I**N THE mountains of Appalachia in eastern Kentucky an undernourished child sits in a dreary one room school writing an essay on soil and water conservation.

After school she trudges home—the bridge is out since the last flood—across streams filthy from coal washings and smelling of dead fish killed by mine acids. She walks a steep mountain path over eroded fields to a squalid house, to home overlooked by raw mountainsides raped by giant coal augers and bulldozers.

Does she see the examples all

about her of the subject of today's lesson—the need for soil and water conservation? The lessons are there to see by those not inured by lifelong familiarity.

## Steep and Rough

The Eastern Kentucky Appalachian area consists of winding narrow valleys, steep mountains, and peaked ridgetops ranging to above 4,000 feet in elevation.

Forty-nine counties of Kentucky are included in the Appalachian Region defined by the Appalachian Regional Development Act. Thirty-five of these are con-



Sediment deposited on valley farmland speaks eloquently of the erosion of hillside fields.



Timber is a major crop in Appalachia, but much of the second-growth forest is of low quality.

sidered as the heartland of Appalachia and typify its conditions.

These 35 counties have a land area of 7.5 million acres, of which 52 percent is in farms. Present land use of the area as a whole is about 9 percent cropland, 7 percent grassland, 73 percent woodland, and 11 percent other uses. The Conservation Needs Inventory indicates there will be a further decrease in cropland and an increase in woodland by 1975.

Most of the soils are derived from sandstone and shale. Those on steep upland slopes are very thin and suited mainly to the production of wood crops. Soils on the toe-slopes are suited to grassland. Land suitable for regular cultivation is confined to the narrow



bottom lands along the streams.

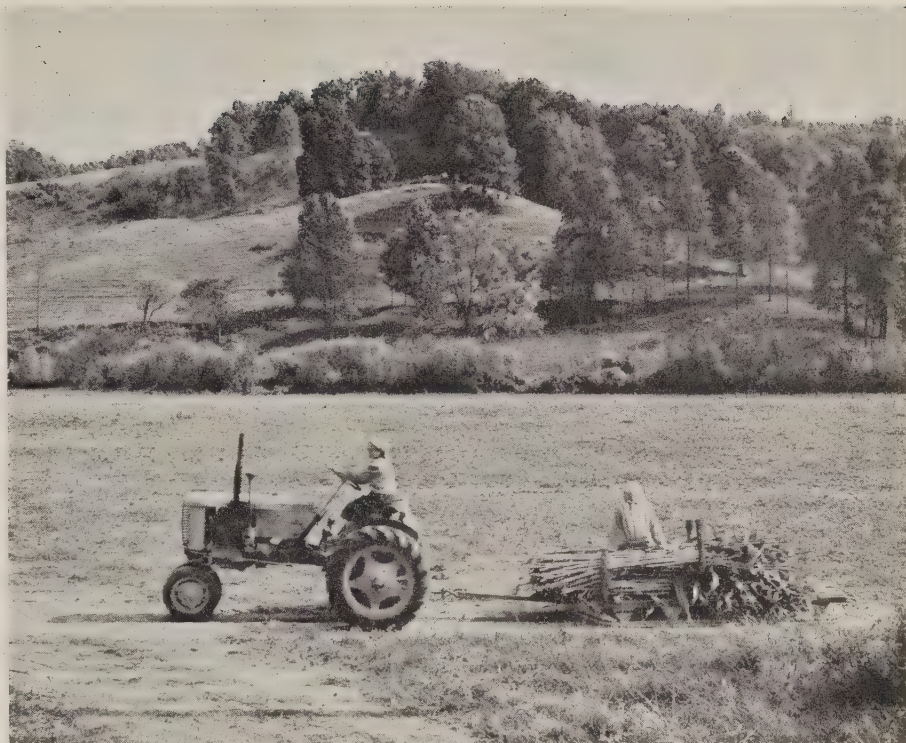
The median-size farm is 55 acres, of which 10 acres is cropland, 8 acres pastureland, 28 acres woodland, and 9 acres idle or in farmstead.

The ownership pattern varies from small holdings to large acreages owned or leased by land companies. Many of the farms are classed as "low subsistence" type units. Of the 33,777 farms in the area, 30,134 have a total gross annual income of less than \$2,500.

The limited amount of land suitable for cultivation and the steep topography generally prevent the use of modern farm machinery. The combining of small farms into larger commercial units is usually impractical because the small areas suitable for cropland and grassland are widely scattered.

### Erosion Serious

Serious erosion problems exist on approximately a million acres. Erosion control is needed on 225,000 acres of cropland, 416,000



A load of cane on the way to the home-operated sorghum mill for processing into sirup is typical of operations on Appalachia's many small farms.

acres of woodland, 482,000 acres of pastureland, and 32,000 acres of other land.

Opportunities for off-farm employment have become more limited each year of the past decade. Industry has not moved into the rural areas, and the coal miners have been displaced by machinery.

Water is a curse and a blessing to Appalachia. In January 1957, southeastern Kentucky sustained property damages in the millions of dollars, and 12 lives were lost. Another major flood occurred in 1963 with heavy property damage and loss of 3 lives. Less spectacular flooding happens every year along the smaller tributaries and creeks. Cropland along streams is often damaged by deposition of undesirable material or by deep scouring when a stream jumps its banks.

Many stream channels are choked with sediment from strip mine areas, farmland, and roads. Numerous streams are polluted by mine acids and spoiled through use as garbage dumps.

Flooding and poor quality water are symptoms of problems relating to land misuse, abuse, and poor cover.

With more than 80 percent of the land best suited for growing

*(Continued on p. 282)*



Fish kills commonly result from acid mine water, industrial pollutants, and municipal wastes (photo courtesy of Kentucky Department of Fish and Wildlife Resources).



A mining spoil dump leaves debris exposed to the erosive action of rains.



## The Program

**Georgians expect 1965 Appalachian Act to speed up area's resource conservation**

**By Robert W. Oertel**

*Assistant State Conservationist, SCS, Athens, Ga.*

**D**ISTRICT supervisors in eight soil and water conservation districts in northern Georgia expect the Appalachian Regional Development Act of 1965 to help them speed up the conservation and development of soil and water resources. Title II of the act is of particular interest to them.

Section 201 provides for an Appalachian Development Highway System; section 203 for Land Stabilization, Conservation, and Erosion Control; section 204 for

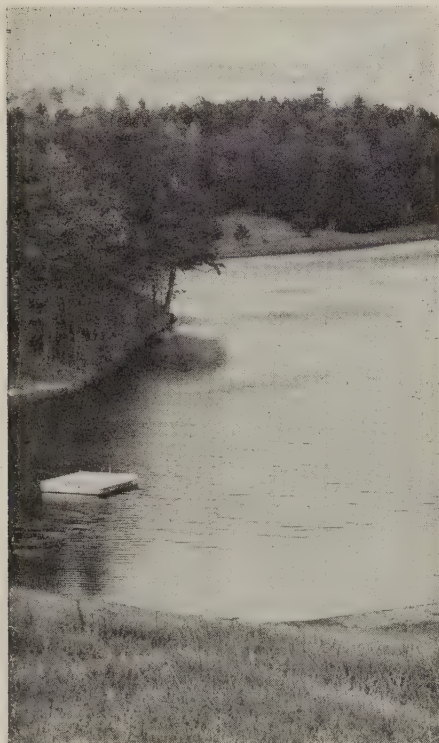
Timber Development Organizations; section 205 for Mining Area Restoration; and section 206 for a Water Resource Survey. In addition an accelerated watershed program will help the districts to meet the objectives of the act.

Although blessed with bountiful rainfall, the entire Appalachian area badly needs improved water management. Only careful development of this rich resource can prevent flood damages and insure an unfailing year-round water supply to meet municipal and industrial requirements.

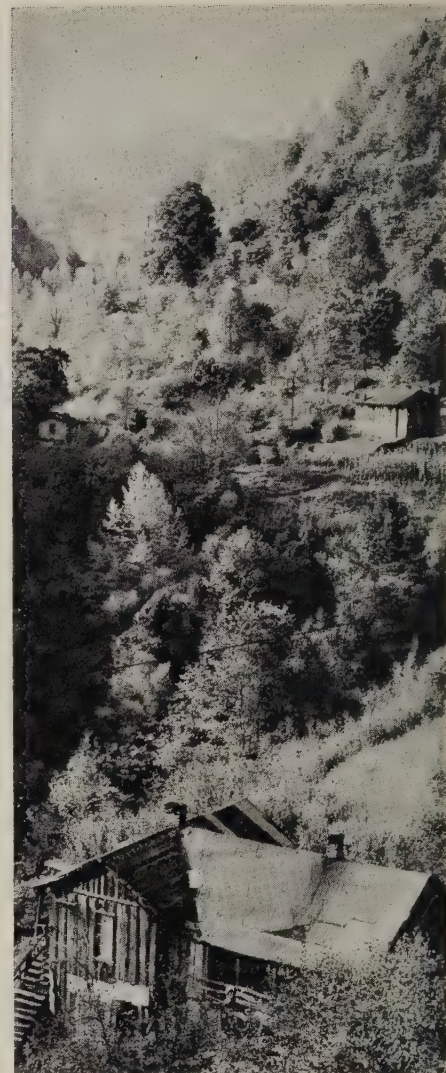
North Georgians have learned quickly that watershed projects produce multiple benefits for entire communities. As a result, interest and activity of local people have mushroomed. Projects are in some stage of planning or operation in every one of the 35 Georgia counties in the Appalachian area. Three projects have been completed, 13 are under construction, and 8 are in the planning stage.

Twenty-four applications for initial investigations and surveys have been approved by the State Soil and Water Conservation Committee. These and 63 others from the remainder of the State await planning authorization.

Twenty-seven towns in 18 watersheds in Appalachia have requested assistance in providing additional municipal water storage for present and future use. Some of these are being planned, and others are awaiting this assistance.



Watershed projects are already bringing multiple benefits to Appalachian communities. The water resource survey provisions of the Appalachian Act will speed planning of new projects.



Small subsistence farms are crowded into narrow mountain valleys between wooded hills.

Although progress has been good, leaders agree that time required for surveys and work plan development slow down the watershed program. It is during this process that local sponsors find out whether their problems can be solved by a watershed project. Only after acceptable work plans are completed can the project proposals be forwarded to the Department of Agriculture for approval and commitment of Federal funds for construction.

Within the total 11-State Appalachian Region there are 66 watershed projects under construction, 38 authorized for planning, and 70 unserved applications. The



water resource survey should help relieve some of this backlog.

Successful watershed projects result only where a complete program of land treatment is coupled with structural measures. The limited economic resources of most landowners in the Appalachian area delay the application of needed land treatment measures. The Land Stabilization, Conservation, and Erosion Control section of the act will enable the Federal Government to contract with landowners to establish some of the needed measures on a maximum of 50 acres on each farm.

The contract feature assures landowners that sufficient financial assistance will be available to install the conservation practices covered. It would also insure the Federal Government that the land treatment program would progress in an orderly fashion to achieve maximum effectiveness of the total watershed program.

Roadside stabilization has long been one of the major objectives of soil and water conservation districts. Naturally the supervisors are keenly interested in the Appalachian Development Highway System portion of the act. They express hope that it will enable them to speed up their efforts to stop harmful erosion on all roads in their districts and provide needed access to areas which have not been readily accessible.

Ben Overstreet, chairman of the Chattahoochee River Soil and Water Conservation District and a long-time advocate of watershed development, summed up the attitude of conservation leaders toward the Appalachian Act:

"District supervisors have been pushing hard for a long time to develop the soil and water resources for the benefit of all our people. If the Appalachian Act will enable us to move closer to that goal, we'll take advantage of it to help us carry on our district programs." ♦

## A Look at Appalachia . . .

# In Perspective

## West Virginia flashback traces ebb and flow of people and prosperity in highland area

By Glendon P. Burton and Ross Mellinger

*Area Conservationist, SCS, Parkersburg, and Woodland Conservationist, SCS, Morgantown, W. Va.*

**L**ET'S take a trip into a part of Appalachia from the junction of the Little Kanawha and Ohio Rivers at Parkersburg, W. Va. Our flashback in time will take us over 165 years of land use history in one of America's unique resource regions.

Starting about 1800, we join up with the first settlers traveling by boat and on foot eastward along the Little Kanawha River and its tributaries into Wood, Wirt, Ritchie, Calhoun, and Roane counties. They gain footholds in the wilderness along the stream.

When their first rough shelters are built, they spread out from the stream bottoms to conquer the hills. Their growing families and improving markets for food and timber force them to clear the steep hillsides. They find the soil is good. They can grow corn, wheat, hay, and pasture.

### Industrial Boom

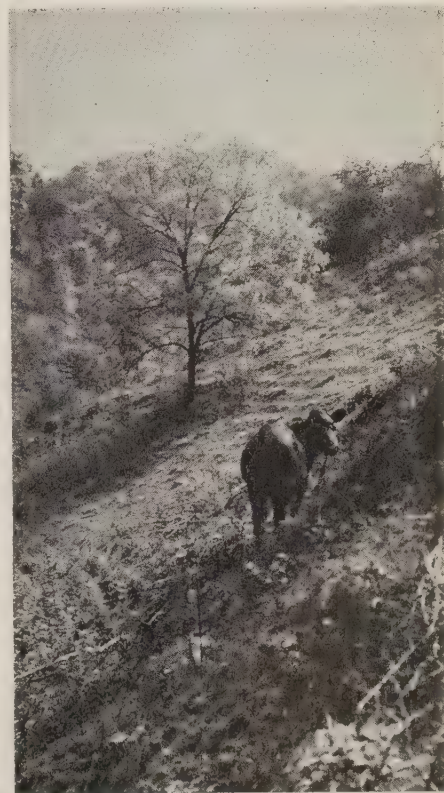
In the 1860's, the discovery of oil at Burning Springs, Wirt County, sets off a booming oil and gas industry. Oilfield workers establish homesteads farther back in the hills. There is soon "a family in every hollow."

Oil did for the Kanawha River area what coal mining did to much of the rest of Appalachia—stimulated an industrial development that left its workers stranded when the resource faded.

Soon lumberjacks move in with axes, saws, and oxen to move the

timber to the streams. Trees that can't be sold for timber are "log rolled" and burned. Leases to clear land for "three crops of corn" are common.

Food must be grown for home use and for barter; woodland must be changed to pasture to grow cattle and sheep. There is no corner grocery store or supermarket. This is a period when each farm is nearly a self-sufficient unit. The land responds to human



The first pressure of settlement cleared away the forests and pushed farming up the steep hillsides.





A new generation of wood-using industries is based on the region's second-growth timber.

needs—but at a price.

During World War I more steep land is plowed for grain. Farmers soon begin to notice that the plow often strikes rock where it didn't before. Are the stones growing out of the soil?

### Price of the Plow

Parts of the field are now red instead of brown and the corn doesn't grow well there. Gullies begin to appear. Even when plowed in or filled with stones, they soon wash out again.

Pasture fields don't "green-up" as early in the spring; strange grasses and weeds begin to replace bluegrass. On steep slopes the land begins to slip and slide in large chunks.

The streams run muddy red after hard rains, and they completely dry up in the summer. Dug wells have to be dug deeper. What is happening to the land and water?

This is a period of large farms for hill country. Many are 200 acres or more. Wheat and oats are often cradled on fields too steep for a binder. Corn is the big grain crop. Hillside plows and sure-footed teams make it pos-

sible to plant the steepest slopes. The average "mechanized" farm of this period has a team of horses, hay rake, two-horse mowing machine, a wagon, and a sled.

This is truly the time of the family farm. The whole family works from dawn to dusk. But it is not an unhappy time. Neighborly visits; exchange of labor at harvest time; Saturday night in town; Sunday at church; husking bees; homecomings; picnics and political rallies—these provide social contacts and recreation.

### The Weary Road

Roads are a real problem. The soils contain heavy red clay; slips and slides are common. From early November 'till the first of May, travel for any distance is a major task. Horses sink to their knees and wagons to the axles when the ground softens. A hard road is a rare treat for the mud-weary traveler.

Following the "big family" period, farms become smaller. Land is being divided up among heirs, until in the 1930's the average-size farm is about 100 acres. About 30 acres is woodland; the other 70 equally divided between pasture

and former cropland used as meadow. Farmers have a subsistence level of living, but wants are few and some folks comment that they made it through the depression years by "lack of expense."

Soils are impoverished and eroded; livestock prices are riding the bottom; there is little incentive for farmers to invest in large scale soil improvement measures. In fact, it is almost impossible to find the money, no matter how attractive the promised returns. Yet this period spawns the soil conservation program and the concept of "using land within its capabilities and treating it according to its needs for protection and improvement."

### Exodus Begins

During and after World War II, the rapid expansion of industry creates new jobs. Young people leave the farm. The old folks pass away or retire, and many farmsteads are abandoned. Population declines rapidly, and the land starts to revert to its original state of the 1800's—timber.

The farmers who stay see that it takes more and better land, more intensively used, to survive.

Mechanization joined with modern soil conservation techniques turn the trick. But only a few farms can do this because the kind of land needed is scarce.

Now, on long weekends the children and grandchildren return to the old homestead, driving late model cars. The young people left Appalachia to earn their way in industrial areas of the Piedmont and East. There they established a reputation as excellent workers in industry.

A few small industries appear in Harrisville, Grantsville, Elizabethtown, and Spencer—clothing, rubber goods, metal fabrication, and wood products are manufactured. These help utilize the skills of local people, but there is still a surplus of labor and the better



opportunities for ambitious young people lie elsewhere.

In the 1960's, local leaders begin to study their communities and themselves. They realize that the vision of large industries, employing thousands of people, appearing back in the hills, as if by magic, is only a dream. They agree that progress must come mostly from conservation and development of the region's natural resources, supplemented by small industries where possible. They adopt the "drop your bucket where you are" philosophy.

### Wood Is Hope

With 68 percent of the land now in woodland and with 1.73 billion board feet of timber on good timber-growing soils, wood-using industries are developing. Pulpwood is being produced from the pine that sprang up on the old crop fields. Trees are being planted. Sawmills and wood-treating plants are starting to utilize the hardwoods. The idea of tree farming for continuous production is catching on.

In the 1960's, soil and land use problems are still present. After heavy rains, the streams still run red. We see raw, eroded areas in overgrazed pastures; slips and slides on hillsides; eroding road banks and streambanks.

Here and there, as we get close to Parkersburg, we see erosion problems created by ill-planned housing developments as the city moves to the country.

We see thousands of acres of rough, unstable land gradually being taken over by low-value trees and brush. We wonder if good trees will be planted on these areas before it is too late and too costly.

Roads are still a problem. Designed to "get farmers out of the mud," hard tops were put on old roadways. They are not suitable for high speed travel and heavy loads. Bridges are small and

posted with low load limit signs. We wonder how heavy wood products can be moved to market over these inadequate roads and bridges.

Where roads are good, people who like rural living locate homesites. Some are factory workers in plants along the Ohio River. Some are retirees. Some are former residents returned to the scenes of their childhood. Where roads provide quick transportation, they prefer to live in the country.

### Beauty Beckons

The great natural beauty of this land in the spring, summer, and fall beckons the vacationer. The Little Kanawha River is noted for its bass, muskies, and big catfish. In the woodlands, squirrels, grouse, and deer are plentiful and on the increase. A good boating pool is located behind the Elizabeth Dam. All of these things, plus many other outdoor activities, are recreational opportunities yet to be fully developed.

We wonder what it's going to take to effect the conservation and development of natural resources necessary for better living in this part of Appalachia.

Landowners cooperating with

soil conservation districts have succeeded in curbing erosion and improving land use on individual properties. Some with adequate land resources for profitable agriculture have found a measure of security. But not more than 50 percent of the land has been placed under safe and profitable conservation management.

A small watershed project on Bonds Creek provides protection to valley farmers and recreation facilities for the city of Pennsboro, but its 9,435 acres is just a patch on the mountainous terrain needing such coordinated planning and treatment.

Currently, committees of local leaders are exploring the possibilities of a Resource Conservation and Development project for five counties under the Department of Agriculture program administered by the Soil Conservation Service.

And now, the Appalachian Regional Development Act offers promise of new aids for building a stable economy on the region's natural resources.

Of one thing we are sure—the land endures and if the people put their minds and hands to it, they can fashion a good life in Appalachia. ♦



Cooperators with soil conservation districts have succeeded in establishing stable farm units.





**Building sites left exposed during construction dump tons of sediment into suburban streams.**

# Soil Erosion in Urban Areas

***Old problem takes a new form as bulldozer replaces the plow in land destruction***

**By Verne M. Bathurst**

*Assistant State Conservationist, SCS, College Park, Md.*

**V**ALUABLE surface soils have been washing into America's streams, rivers, and harbors ever since the earliest colonial clearings of forest and field. Soils that were many centuries in forming were eroded away in a single rain-storm because of improper land use and inadequate protective programs.

The erosion crisis, which in the 1930's spurred a vigorous soil conservation effort, today is moving from the Nation's farmlands to its rapidly growing urban and suburban areas. The builder's bulldozer bids fair to become the modern successor to the farmer's plow as the instrument of soil destruction.

Soil conservation districts now include 94 percent of the land in farms. Although rural land treatment is far from complete—the Conservation Needs Inventory

estimates it as adequate on about one-third the non-Federal acreage—the spread of conservation practices and the trend away from cultivated crops in many sections of the country are stemming the inroads of erosion on farmlands.

## **Land in Transition**

But soil stripped of its natural cover and inadequately protected against erosion remains a source of sediment threatening many watersheds. The problem is especially acute in that hazy zone between the open country and completely built-up urban centers.

In countless American suburbias the land is being peeled of its surface soil and left to erode, to clog drainage systems, and pollute streams.

“Some of the worst erosion on sloping land in the United States is around our growing metropo-

litan areas where grass, trees, and shrubs have been scalped from the land, unnecessarily, and the land left exposed until the lots are sodded as the last part of construction,” according to Dr. Charles E. Kellogg, SCS deputy administrator for Soil Survey.

Studies made in the metropolitan areas of Washington, D. C., and Baltimore, Md., describe the twin problems of erosion and sedimentation which are common to many rapidly developing communities throughout the Nation.

Sedimentation is pronounced in the Potomac River basin which President Johnson has designated to be made a model of conservation and beautification.

## **Sediment in the Potomac**

Sediment discharge in the Potomac River basin ranges from 21 to 2,300 tons a year for every square mile of drainage area, studies by the Interstate Commission on the Potomac River Basin show. In some places near Washington, sediment is more than 9 feet thick at the bottom of the Potomac. An estimated 2.5 million



tons of sediment is deposited annually at the mouth of the river. Much of it comes from nearby urban and highway construction areas.

The urbanized downstream two-thirds of Rock Creek watershed in Montgomery County, Md., and the District of Columbia contributes an estimated 29,000 tons of sediment annually, even after the sharp reduction in erosion following development. Fully 93 percent of this sediment is transported to the Potomac River.

SCS engineers and soil scientists estimate that the Patapsco River at Baltimore carries 600,000 cubic yards or nearly 500,000 tons of sediment into Baltimore harbor each year. The cost of dredging the harbor channels amounts to \$100,000 a year.

Damage caused by sediment to

commercial and sport fishing and to the oyster beds of the Chesapeake Bay has not been measured. Biologists and fish and wildlife experts say it amounts to millions of dollars.

### Building Speeds Erosion

The Northern Virginia Soil Conservation District has reported that the annual sediment discharge into Bull Run, which drains a watershed in Fairfax County where intensive urban development has not yet begun, is 146 tons per square mile of watershed. The discharge rate for Difficult Run, where urbanization has begun, is 380 tons, and for Accotink Creek, where urbanization is well under way, 690 tons.

Residential construction has caused about 25,000 tons of sediment to be deposited in Lake Bar-

croft in Fairfax County each year for each square mile urbanized, or 39 tons an acre, according to the district's study. The capacity of the lake has declined by 12 percent since 1950.

Urbanization need not, of course, contribute to excessive soil erosion and sedimentation. At Loch Raven and Prettyboy reservoirs in Maryland, which serve the city of Baltimore, sedimentation rates dropped substantially when large acreages in these watersheds were converted from agriculture to residential and other nonfarm uses, with proper precautions against erosion in the process.

The land use changes in the watersheds were scattered, and plant cover was largely preserved. Much of the land kept in farms was placed under conservation plans. As a result, erosion was reduced 56 percent in Prettyboy watershed and 70 percent in Loch Raven watershed. Forests owned by the city of Baltimore that border the reservoirs trap some sediment before it reaches the water storage areas.

In contrast, at Lake Barcroft urbanization was more abrupt, and large areas had no plant cover for periods ranging from 3 months to 3 years. Construction was concentrated near the reservoir, so that almost all the eroded soil became sediment.

There can be more Loch Ravens and fewer Lake Barcrofts as intensified urban development affects more of the American landscape, for effective controls are possible against the twin evils of erosion and sedimentation. But they will be applied only where there are thoughtfulness on the part of developers and property owners and determination on the part of an interested public. ♦

Continuous cropping with one type plant favors buildup of soil-borne fungus diseases, so rotate with unrelated plants. ♦



The 30-inch storm sewer was too small to carry intermittent runoff from a small watershed draining into Lake Barcroft in Virginia. The sediment and erosion debris from construction sites have spoiled a choice recreation spot.



## Double Du

**W**HEN diminishing farm profits and rising urban taxes threatened the existence of Mrs. William B. Howard's Olney Farm near Bel Air, Md., she decided to combine outdoor recreation with grassland farming to bolster farm profits.

After 4 years of supervising a summer day camp and giving riding lessons, in addition to operating a 250-acre farm with one of the county's largest sheep herds, Mrs. Howard reports her double-duty farm experiment a success.

"Most things on our farm have at least two uses," says Mrs. Howard. The sheep furnish wool and meat. Ponies are the main attraction for our day camp and bring good sale prices. Our pastures



Proper pony care includes saddling and grooming as carried out above by students at the Olney Farm day camp. Pupils also learn to ride and jump ponies. Mrs. Harriet Howard, below on tractor, manages the 250-acre sheep and pony farm and spends many hours in the field with farm helpers.





on . . .

## Land Use

and hayland provide feed for the livestock and riding space for the day camp youngsters. Even I doubt as a farmer and riding instructor."

Fifteen years ago Mrs. Howard became a cooperator with the Harford County Soil Conservation District. James A. Seaman, Soil Conservation Service representative, helped her plan a coordinated program of conservation measures needed to protect her rolling grassland and acreage. The conservation plan, updated to meet changing land use demands, is still the basis for her long-range farm planning. A half-acre pond provides irrigation water for a 2-acre family vegetable garden and fire protection for the picturesque farm



This historic old Olney Farm house, above, is a center of activity. Two day camp pupils are shown heading for the riding ring where they learn horsemanship. At left, day campers get an hour and a half of swimming daily under the training of Mrs. Ann Knisely. Below, a few of the 100 or more sheep that roam the farm. Most are Hampshires.





home and nearby stables. Sixty-five acres of improved pasture provide feed for the sheep and ponies. Mrs. Howard rents additional pasture and hay land to insure ample forage for her livestock.

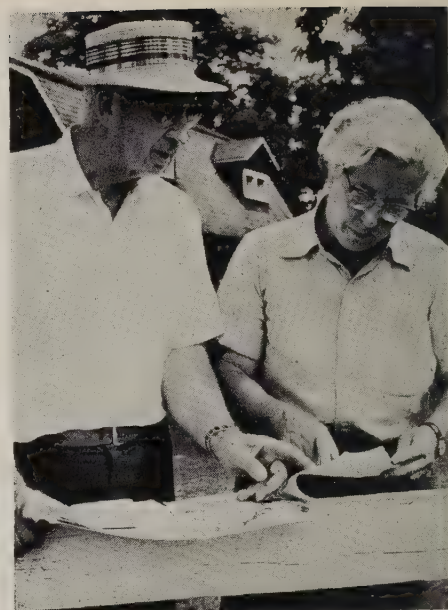
A 100-acre woodlot, thinned to produce better timber, has numerous riding trails for day camp use. Small erosion-prone areas, not suited for pasture or hay land, have been planted with pine seedlings and wildlife food-producing shrubs.

The family garden, managed by one of Mrs. Howard's dependable helpers, keeps the farm well supplied with fresh, canned, and fro-

zen vegetables most of the year. Three milk cows, a few black Angus cattle, and some chickens make the farm nearly 100-percent self-sufficient.

The summer day camp is the big recreation feature on Olney Farm. Each year a limit of 35 children, 6 to 15 years of age, enlist in the 6-weeks' session.

Mrs. Howard, an expert in horsemanship, supervises the camp with help from her daughter, Mrs. Frances Demme, and daughter-in-law, Mrs. Amabel Howard. Mrs. Ann Knisely, of Bel Air, supervises a change-of-pace swimming class for the day campers. Seven



James A. Seaman, SCS conservationist, and Mrs. Howard look over Olney Farm conservation plan. Mrs. Howard is a Harford Soil Conservation District cooperator.

teenage counselors, mostly graduates from the camp, round out the staff.

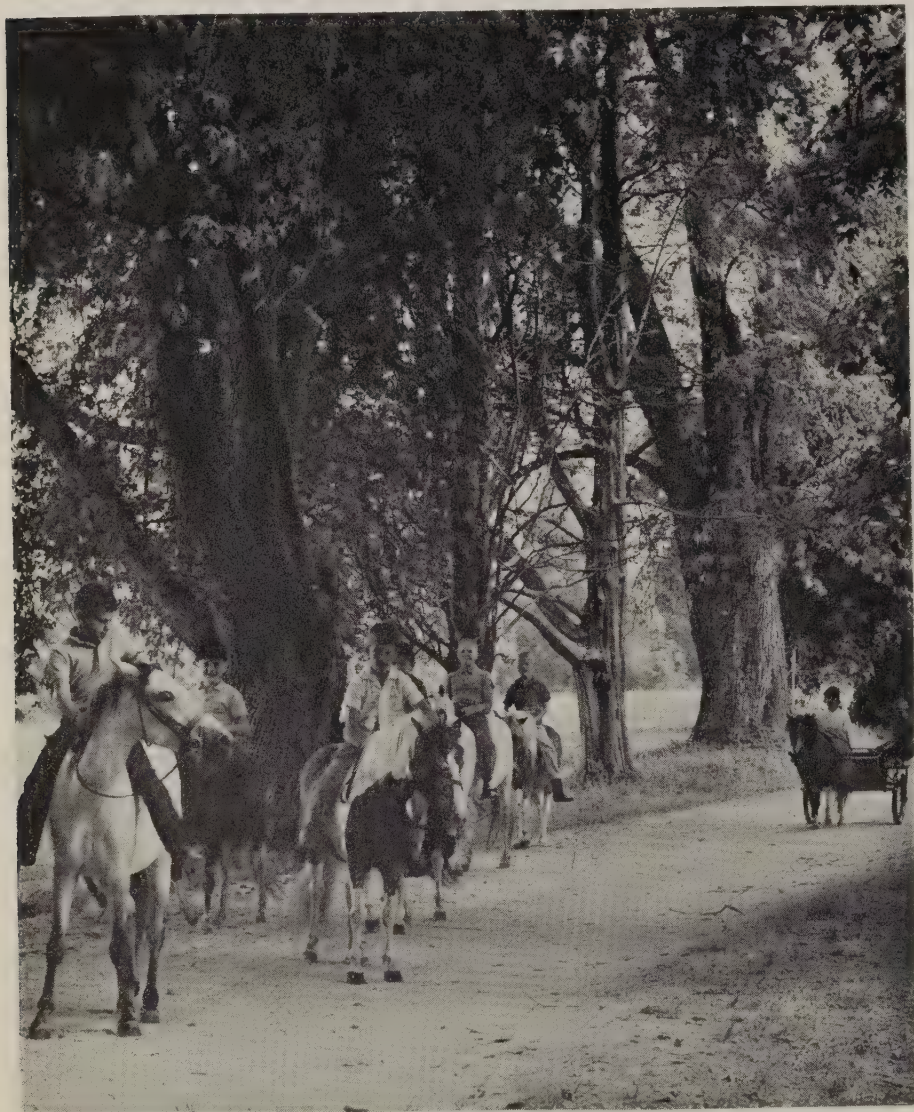
"The schedule is geared to give the children plenty of action. They learn to catch, clean, saddle, ride, and jump the ponies," says Mrs. Howard. "And, they get expert swimming and diving lessons in our pool."

Looking to the future, Mrs. Howard plans to build a new riding ring, enlarge the farm pond, and add more conservation measures to keep the farm productive and protected.

"Seems like I teach riding all day and farm after 4 p.m.," said Mrs. Howard, "and it's like a three-ring circus here . . . but we enjoy it, and it all adds up to a good way to build our farm income." ♦

### Cropland Conservation

Cropland conservation requires combinations of enduring land-improvement measures and recurring cultural and management practices. Seldom will either type of treatment suffice alone; usually both need to be used together. ♦



The shady entrance lane at Olney Farm is ideal training ground for day campers. Proper open road riding is taught in this session.



# Grazing Native Grass Proves Conservation Use of Fresh Marsh

By Thomas N. Shiflet

*Range Conservationist, SCS, Alexandria, La.*

**T**HE marshlands of Louisiana's gulf coast are indeed a strange world. Productive and teeming with life, they have frustrated many landowners' efforts to turn them to profitable use.

Cultivation of marshlands is of doubtful practicality; some experiences have been little short of disastrous. If fresh marshes with peat surfaces are cultivated, they shrink. Some of them have been used for the production of rice—and some still are, but with questionable success.

Their value as a wildlife habitat, of course, is well established.

But Raywood Mouton, Esther, La., thinks he has the answer.

He has a 70-acre marsh area which his conservation plan shows to be land of capability class VII (suitable only for permanent vegetation with severe restrictions on use). The limiting factor is the depth of peat surface to mineral soil. It is more than 9 inches deep—too deep for cultivation although firm enough to support cattle. A portion of the tract was once

farmed to rice but that enterprise was abandoned.

## Grow Paille Fine

In 1962, SCS conservationists assisting the Iberia-Vermilion Soil and Water Conservation District helped Mouton find a way to use the marsh. They pointed out that this land would produce some of the finest native grass in Louisiana. The principal species in the area is paille fine (pronounced pi-feen) which is highly productive and grows on a wide range of marsh soils. It produces as much as 5 tons of air-dry forage an acre and is very high in protein.

The conservationists suggested grazing under a conservation plan that keeps livestock numbers carefully balanced with forage production and maintains the stand of desirable grasses.

Now Mouton runs an average of 60 animal-units on this 70 acres for 8 months of the year. The rest of the time, October 1 to February 1, the cattle graze rice stubble and bermuda and clover pastures.

Grazing native marshland has its advantages over more intensive livestock production on tame pastures and cropland. Improved pastures on better land require liming, fertilizing, mowing, periodic renovation, and other practices. These costs have to be deducted from gross income. But paille fine needs only proper stocking and management; it does the rest.

There are, however, some costs to producing range forage on this marsh. Rainfall must be pumped off because former cultivation has caused the peat soils to shrink, and the surface is lower than the canals and ditches. Without the system of levees and the pump, this would be a shallow intermittent lake. Pumping usually is not necessary on undisturbed marshes.

## Use for Class VII Land

It's a familiar story to conservationists. Class VII land is best suited to grass or trees, and in this case it is grass. Using the marsh for range results in conservation of both soil and water resources. The thick growth of grass maintains the depth of peat and permits water levels that would otherwise have to be kept lowered by excessive pumping.

Mouton has farmed similar land to rice. He found cultivation to be expensive and uncertain. Comparing his net profits, Mouton figures he gets about \$8 an acre a year more from grass than from rice. ♦



Paille fine provides the principal forage for cattle grazing on Raymond Mouton's fresh marsh range.



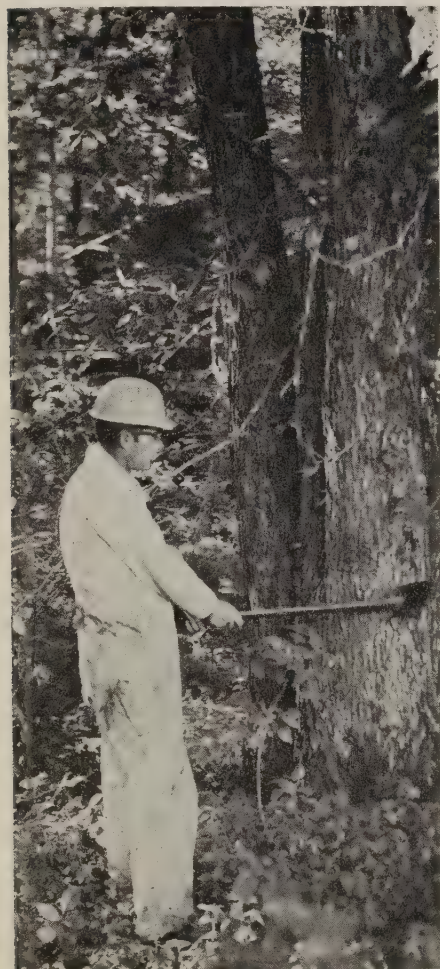
# Contractors Help Speed Woodland Improvement in Northeastern Ohio

By Paul A. Dodd

Work Unit Conservationist, SCS, Ravenna, Ohio

**G**ETTING landowners to improve their woodlands has been a problem for the Portage Soil Conservation District in northeastern Ohio. They have found their answer in the woodland contractor.

The contractor idea for northeastern Ohio was first explored in 1961 at a joint meeting of the farm foresters of the Ohio Division of Forestry and personnel of the Soil Conservation Service from nine counties. At least one potential contractor was invited from each county.



Woodland Contractor Mahlon Carlisle girdles an undesirable tree.

Supervisors of the Portage District had long believed that woodland improvement was being neglected by landowners, and the Conservation Needs Inventory proved they were right. The inventory showed that of 76,600 woodland acres in the county, 66,000 needed conservation treatment. To meet this need by 1975, more than 5,000 acres would have to be treated each year; but the yearly average had been only about 100 acres.

## Inventory Showed Need

The local SCS office began emphasizing woodland work in its public information, and the district published the inventory to show the need for this and other practices. Despite the emphasis, only 114 acres of woodland was treated in 1960. At this point the district urged the meeting to discuss ways to solve the problem.

At the meeting, it was decided that the woodland work could be done on a contract basis at low cost to the landowner. Some potential contractors attended the meeting, and a brief training session was held. Several of the men entered the contracting business as a result.

Mahlon Carlisle of New Milford, for example, did nine contracting jobs in Stark and Portage counties in 1963. This was proof enough to the Portage District that contracting was a feasible way of getting more woodland improvement on the land.

## Field Day Held

Last year the Portage District gave major emphasis to woodland improvement in its annual program. A coordinated information program was set up by the Ohio farm forester, SCS, and the Cooperative Extension Service that

included newspaper and newsletter articles and radio spots about the contracting services available. A forestry field day was held.

Results of these efforts were immediate and dramatic. In 1964, Mr. Carlisle alone contracted more than 20 jobs in Portage County. One of his customers was Noble Hopkins, chairman of the Portage District, whose 21-acre woodlot had a grapevine and cull tree problem. Mr. Hopkins, like most of his neighbors, had been putting off improving his woodlot because other jobs around the farm seemed more important.

Carlisle did the job for the cost estimate, prepared by the farm forester, of \$31 an acre or a total of \$654. The Agricultural Stabilization and Conservation Service shared \$492 of the cost. The grapevines were skinned and poisoned, and cull trees were cut or deadened and left standing.

## Salvage Pays for Work

The contractor does not haul out the cut trees under the contract. But if any of the trees are merchantable as timber, blocking, or firewood, he sometimes reaches a separate agreement on the sale and use of the material. Some landowners have paid most or all of their share of the improvement cost by selling the timber to the contractor, who has contacts with buyers.

What equipment does the woodland contractor need? Power saw, axe, and a spray are starters. A truck and a team of horses to haul out the logs are helpful. A tractor is needed if the contractor does tree planting work on open areas.

Portage County woodland owners are pleased to have contractors available who can do the woodland work they need. ♦

U.S. farmers owned 4.5 million tractors in 1964. Tractors have displaced 22 million work animals and 76 million acres that would have been needed to grow feed for them. ♦



# Conservation Design Tames The Old Cataract Ditch

By Neal P. McKinstry

Work Unit Conservationist, SCS, Craig, Colo.

THE mountain water of Cataract Ditch drops 1,200 feet in 5 miles on its way to the irrigated valley meadows of Moffat County, Colo. En route it picks up an erosion load of gravel, sand, silt, and clay that ends up in ranch laterals and on fertile fields.

Over the years these deposits had sealed the soils against air and water and were responsible for a 50 percent drop in hay production, in an area where winter feed reserves are sorely needed.

Donald Pelley and his sons, Estel and Jim, saw what was happening to the 310 irrigated acres they depend on and resolved to do something about it. So did the Hillewaert brothers, John, Frank, and Alphonso. More than 400 acres of their meadow was being suffocated.

## A Roving Ditch

The neighbors moved sections of the ditch from one swale to another. But each time new gullies formed with the same disastrous results—erosion along the steep routes, deposits on the level land.

The Pelleys and Hillewaerts

signed an agreement with the Moffat Soil Conservation District for the technical help they needed.

Preliminary surveys by the local SCS staff ruled out the practicality of using pipelines or flumes to carry the water through eroded areas. The ranchers just couldn't afford the mile and a half of big conduit that would be needed.

The only solution seemed to hinge on finding a rocky draw where the water could be dropped safe from erosion.

Cedar Draw on the Hillewaert place seemed like the best possibility, since one of its tributaries headed on the mesa about a quarter mile from the upper reaches of the ditch. But three or four stretches along the Cedar Draw looked like weak spots that might start washing. If so, the entire system would be no better than those now abandoned.

## A Safe Route

According to a plan evolved by the conservationist, the Pelleys and Hillewaerts could guard against this hazard by using a series of gradient ditches in the McInturff



Secretary-Treasurer of the Moffat Soil Conservation District, Robert Miller, inspects the chasm cut by the old Cataract Ditch before its renovation.

Mesa area to take the water to the head of a lava rock hillside, there to be spilled into Cedar Draw. After the plunge down the draw, the water would be diverted into



A well-formed lateral ditch (1.), cut with a backhoe, replaces the active gully cut by water running downhill without control from the original Cataract Ditch.



a new 13,635-foot canal. This would carry the water to the Pelley meadows and to part of the Hillewaert fields. A second canal would route water to other Hillewaert fields 2 miles on the opposite side of the draw.

Control structures would be needed, too, the plans showed. These would include combination diversion dam division boxes and diversion gates in Cedar Draw as well as division boxes in the canal.

The practical solution to crossing many of the draws at the base of the mesa appeared to be dams across each drainage. These were eventually built with pipes and sodded spillways to allow floodwater to escape without harming the canal or improvements.

In October 1961, Harland Ross, SCS conservation engineering technician, completed designs, and the ranchers ordered the construction started.

The dirt work was done with Pelley's bulldozer at first. But deep-rooted lava offered stubborn resistance. There were other interruptions, including a forest fire, yet 2½ miles of ditch was finished, and more than 22,440 cubic yards of earth and rock were moved.

## A Finished Job

It was apparent, though, that the dozer would not get the ditches finished in time to save the 1964 hay crop. So the Hillewaert brothers hired a conservation contractor to help.

Work went faster when the contractor began using a back-hoe with "wings" welded to the bucket to form the ditch. The machine traveled a road bulldozed along the hillside. At each pass, it cut a section, perfectly formed, 18 inches across the bottom and with 1½:1 side slopes.

The new Cataract Ditch was put into full service for the 1964 season. For once the Pelleys and Hillewaerts said they were irrigating with water, not mud. ♦

# Appalachian Problems

*(Continued from p. 269)*

trees, woodland as a land use must have a major part in any responsible program for the area.

The forest was clear cut when first exploited. Tens of thousands of acres that should never have been cleared was cropped and pastured until depleted by soil erosion.

Second growth timber is often poorly managed. Forest fires are a common sight. Poor forest cover, eroding logging roads, and sale of timber by tract rather than by volume all contribute to the poor condition of the watersheds.

Economic pressure on the subsistence farmer results in cutting of trees as small as 4 inches in diameter. His future is now; he lives in the present with scant hope that tomorrow will better his lot.

Burned woods, eroded farmlands, coal mine spoil banks, and polluted streams make a poor habitat for wildlife. Water for wildlife is scarce in the higher elevations.

Population began growing in the early 1900's with the rapidly expanding coal and timber industries. In places the population density rose to about 340 persons per square mile of habitable area.

## Buildings Take Farmland

The building of railroads, lumber and coal mining camps, and settlers' homes took up many acres of farmland and resulted in clearing of hillsides for crops. When erosion made the hill land unproductive, it was abandoned and farmers cleared even less desirable mountain slopes.

The location of residential areas, railroads, and roads in the mountain valleys now makes it difficult for local communities to participate in the small watershed program, because the necessary ease-

ments and rights-of-way often cannot be obtained.

The flow of population turned during World War II, and since then, the rate of out-migration has been rapid. Even so, a large part of the population probably will elect to remain in the mountains, although coal mining and lumbering both have proved to be undependable and inadequate sources of employment, even in areas richest in coal and timber.

The area has many problems of health, education, unemployment, personal income, and living standards in addition to those relating to agriculture and natural resources. All are interrelated.

What can the school girl say of the future in her essay on soil conservation? It is true, as her reference materials tell her, that the hope of her family and her community depend on the conservation and development of the soil and water, and other natural resources, of the area.

But the land and water problems of Appalachia cannot be solved on a piecemeal or field-by-field basis. A complete land use and treatment program needs to be developed through a conservation plan and applied on the entire holding of each landowner, then over the small watersheds in the area, and finally to the major watersheds.

The landowners of eastern Kentucky have organized to do what they can to solve their problems. Soil conservation districts cover the area as do multi-county Rural Areas Development Councils. Most individual counties have RAD associations.

These people have demonstrated their willingness to do what they can with what they have, but too often what they have is not enough. For example, the majority of soil conservation district cooperators are financially unable to establish practices recorded in their conservation plans, even with the help of ACP cost-sharing.



There is real hope that the Appalachian Regional Development Act will accelerate going programs for wise use and treatment of soil and water.

Then the years ahead may see our school girl, well-dressed and well-nourished, graduating with

her class from a school with modern buildings and equipment and eventually establishing a pleasant home in a prosperous valley town.

The lessons she learns in writing her conservation essay are crucial lessons for all the people of Appalachia. ♦

## Tennessee Community School Provides A Study in Conservation at Work

By E. B. Dyer, Jr.

*Work Unit Conservationist, SCS, Elizabethton, Tenn.*

**T**HE Unaka High School in the Watauga Valley community of Carter County, Tenn., offers its 400 students more than the usual educational advantages of a modern building with cafeteria, gymnasium, library, and shops.

Behind the new building is a 40-acre forest of pine and hardwoods, an outdoor laboratory for students of biology, general science, and agriculture. Vocational agriculture students have laid out a nature trail and marked and identified the trees. Biology students have a place to study plants, animals, minerals, and other features of the natural landscape.

The school will share this treasure. Plans call for a Boy Scout camp and a community picnic area.

On another 30 acres the school and community leaders have developed a soil and water conservation workshop in cooperation with the Carter County Soil Conservation District.

### Successful Campaign

The Watauga Valley Community Club, a local member of the school board, and other leaders competed with other communities for the proposed new high school, and won.

When the contractors moved

away, the beautiful new building sat in an unsightly field of raw and exposed soil. Rocks and boulders showed everywhere.

The rains came and runoff water carried mud from the barren area. Storm sewers filled, and mud flowed into the schoolhouse.

It was then that County School Superintendent Tommy Neece and J. R. Garland, chairman of the Carter County Board of Education, asked for help from the Carter County District. Principal J. E. Taylor and John Morgan, the vocational agriculture teacher, and the vo-ag students joined the team that worked with the local SCS conservationist in developing a conservation plan.

### First Experience

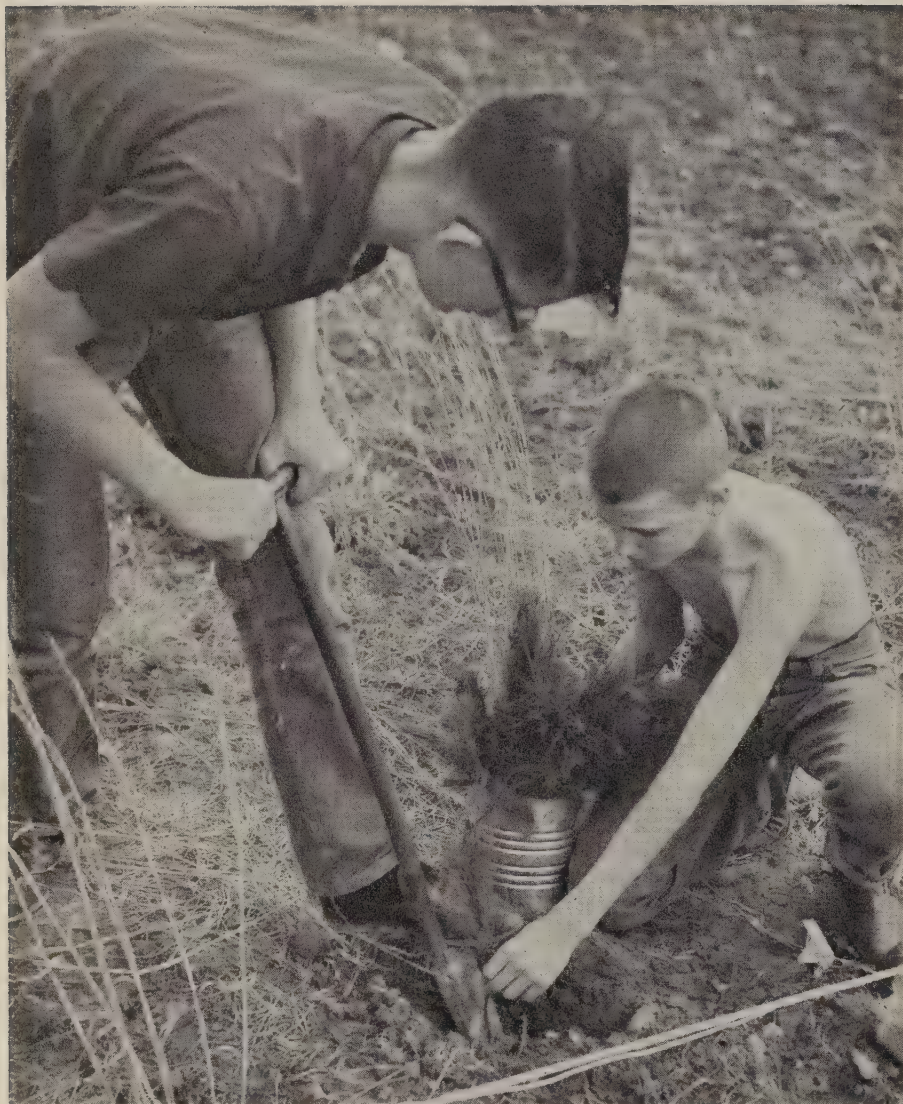
Many students gained their first experience with conservation planning based on a inventory of soil resources. Fertilizer, lime, and planting materials were supplied from money raised by the community club, Parent-Teachers Association, and the school board.

The project became a working class in soil conservation. Students planted fescue, ryegrass, and clover, and then applied a straw mulch. Steeper slopes were protected with flocks, periwinkle, and shrubs, as well as grass. Trees and



The Unaka campus is backed by the school forest that was turned into an experimental study to determine tree species best adapted to the site. The foreground is graded and planted to control erosion.





Unaka students plant pine trees in experimental plot on school grounds. The students planted 5,000 seedlings.

ornamental plants helped to beautify the campus.

A waterway was shaped and sodded to receive water from a diversion terrace to be built later. A system of tile drains was designed and installed to relieve an area of water-soaked bottom land in front of the school. Then baseball and football fields were built on land that was formerly too swampy.

With the most urgent parts of the conservation program behind them, the students turned their attention to the 40-acre woodland. A woodland inventory and management plan were made with as-

sistance from Ted Melton, Tennessee State service forester.

### Educators Approve

"This is one of the outstanding examples of how conservation education has become more than just a theory," said George Worley, president of the Conservation Education Association, after visiting the school with 300 educators attending the national convention at nearby East Tennessee State University in 1963. "This campus is a living example of people accomplishing conservation of natural resources through teamwork."

"When schools, teachers, and

communities become interested in using our natural resources wisely—then and only then can conservation become effective," added Roe Warren, chairman of the board of supervisors of the soil conservation district. ♦

## Grass Seeding Pays off on Kansas Estate

**S**EEING native grasses on old cropland doubled the range-land acres on the A. J. Rice Estate in Graham County, Kans.

Before 1957 J. B. and Jim Cameron farmed almost 2,000 of the 3,000 Rice Estates acres. Today they farm less than a thousand and run cattle on the remainder.

The first seedings were made in 1957 when they "banked" 450 acres of eroded cropland under the Soil Bank Program.

To finish the conservation job as soon as possible on his part of the estate land, J. B. Cameron filed the first application in Graham County for help under the Great Plains Conservation Program. He completed his conservation plan and signed the contract in 1959.

Jim Cameron placed his 640 acres under contract a year later. Both plans were completed and the contracts expired in 1963.

The two plans scheduled grass seeding on 614 acres in addition to the Soil Bank land. Most of the area was Class VI land.

Says J. B. Cameron, "Some of the eroded land would not grow enough crops to pay for the gasoline used to farm it. It's strange how good the grass is on land that wouldn't grow anything else. We planted one field to feed, and it didn't get big enough to harvest, even with normal rainfall. Yet, the grass in that same field will probably feed a cow to 8 acres in the driest years."

To keep the grassland in top



condition they plan to maintain a cow herd of 200 to 225 head, depending on the growth of the grass.

The Kansas Bankers Association recognized the Camerons early in 1964 for their outstanding conservation work on completion of the Great Plains plans.—ARTHUR W. POPE, *Work Unit Conservationist*, SCS, Hill City, Kans.

## Pasture-Hay Program Makes Dairy Farm Pay

WHEN you get 17,000 pounds of milk and 650 pounds of butterfat a head from your milkers, you've got something good going for you.

That's the way Darrell Kerby's 65 Holstein cows score today. And it's all due, he says, to sound management of pastures and a rebuilt irrigation system.

Kerby's 135-acre dairy is on the Clearwater River near Cherry Lanes, upstream from Spaulding, Idaho. It's an area famed now for its dams and wanigan log runs. But in the early 1900's, and for some years after, Cherry Lanes' orchards were top cherry producers.

The orchards have long since vanished and the land is now in hay and pastures.

When in 1952, Kerby, a former county agent and University of Idaho graduate, and his brother took over the farm, he realized a life-long dream. But right off, they ran into problems that kept them from moving ahead with their dairy plans.

The 14-year-old 1½ miles of welded steel irrigation mainline was corroded and needed to be replaced. And the onsite bank pumping station couldn't be used until log running was over each summer—usually well past the season when crops needed irrigating.

In 1960, Kerby took over the dairy and began reorganizing the old irrigation system as a coopera-

tor with the Nez Perce Soil Conservation District. With Agricultural Conservation Program cost-sharing funds, he replaced the rusty mainline with galvanized steel pipe.

Next, he built a permanent pumping station, following a design prepared by the Soil Conservation Service. It operates from a sump located at a safe distance and height from log and ice jams in the river.

He is carrying out other conservation work on his dairy land. Crops are rotated on a 5-year basis. He green-chops alfalfa and gets six cuttings a year.

To keep a high quality of forage he renovates the hayland-pasture every 5 years. He plows 20 to 30 acres of sod each year and plants back the same year.

He says, "The high milk output of our cows is due largely to feeding unmaturing green legumes from April 1 to November of each year." —HOMER C. MOORE, *Area Engineer*, SCS, Moscow, Idaho. ♦

## Land Capability

About half of the Nation's non-Federal rural land is suitable for cultivation. The other half is better suited to uses that keep it in permanent vegetation.

Classification by land capability in the National Inventory of Soil and Water Conservation Needs shows that 44 percent or 637 million acres is suitable for regular cultivation (class I-III); 12 percent or 169 million acres is marginal and is suitable for occasional or limited cultivation (class IV); and 44 percent or 641 million acres is generally not suitable for cultivation (class V-VIII). ♦

In 1870, 1 farm worker in the United States produced enough food for 5½ persons. At the beginning of World War II, the figure was 10½. Today 1 American farmworker is producing enough food for 30 people. ♦

## What Do Retired Conservationists Do?

DID you ever wonder what a retired conservationist does? Since John Aycock retired from the Soil Conservation Service some 2 years ago, he has become a full time conservation farmer. John spent more than 30 years assisting and encouraging others to control erosion and develop their soil and water resources on west Tennessee farms.

John enjoys daily activity on his 200-acre farm near Millington, Tenn. His program includes cotton, corn, soybeans, and livestock. The row crops are placed on the best class II land on the place. Waterways are well kept for the removal of excess water, and hay is harvested from these areas. These crops are rotated with a grass-legume mixture which does a good job of maintaining soil fertility as well as organic matter.

The uplands on John's farm are in tall fescue, Coastal bermudagrass, and common bermudagrass, overseeded with lespedeza. These varieties provide an abundance of pasture for his herd of Shorthorn cattle. John maintains close watch to make certain that pastures are not overgrazed and that grasses make sufficient growth so that cattle can graze almost the year-round. Excess growth is cut and stored.

Wildlife areas on the Aycock farm are protected by a fence to provide a quiet place for birds to nest or rabbits to raise their young. Other areas are protected with multiflora rose to separate cropland and pasture and to provide useful and scenic wildlife habitat.

John is practicing what he preached for so many years and is realizing a good return financially as well as the satisfaction of a job well done—T. F. JONES, *Work Unit Conservationist*, SCS, Memphis, Tenn. ♦





**The Economic Demand for Irrigated Acreage.** BY VERNON W. RUTTAN. 1965. *Resources for the Future*, Washington, D.C. (Johns Hopkins Press, Baltimore). 139 pp., charts. \$4.

The subtitle, "New Methodology and Some Preliminary Projections, 1954-80," points up the main subject of the book. It is to describe and illustrate a new set of "flexible elasticity" models for estimating relative profitability of investment in irrigation in different areas and under different conditions.

The mathematical descriptions of the models and discussion of the theory underlying them, which make up much of the book, will be of interest mainly to technical economists. All readers concerned with water resource use, however, will be interested in the resulting projections and comparisons with those made by other methods.

Traditionally, irrigation claims more than 90 percent of all the water used in the Western States. But rising demands for urban, industrial, and recreational uses offer increasing competition for the limited supply. A reliable method of indicating optimum choices among alternative policies in water use would be a welcome tool to resource planners.

The results of the elasticity models are considered to be a better indication of future developments than the estimates of "requirements" to meet assumed levels of production, as used by the Department of Agriculture and Bureau of Reclamation for the Senate Select Committee on National Water Resources. In general, they are higher than the "high" projections of USDA and lower than those of the Bureau of Reclamation.

These estimates also suggest that land and water development in the subhumid East may be more economical than extension of irrigation in the more arid regions of the West where other uses of water would have higher value.—B.O.

## New Publications

**Soil-Temperature Regimes — their Characteristics and Predictability.** BY GUY D. SMITH, FRANKLIN NEWHALL, LUTHER H. ROBINSON, AND DWIGHT SWANSON. 1964. *USDA SCS-TP-144*. 14 pp., charts. A review of available information mainly from the United States and Puerto Rico, including examples from many countries and climates. Soil temperature is one of the important environmental factors affecting plant growth that is considered in the new soil classification. For most practical purposes, the temperature regime can be described by the mean annual soil temperature, the average seasonal fluctuations from that mean, and the mean warm and cold seasonal soil-temperature gradient in the root zone. This paper summarizes data on these soil properties.

**Research on Water.** 1964. *Soil Science Society of America, Madison, Wis. Spec. Pub. 4*. 121 pp., illus. \$1.50. Thirteen short papers presented as a symposium cosponsored by the Soil Conservation Society of America at the 1963 annual meeting of the Soil Science Society of America at Denver, Colo. One is by an SCS author, John T. Phelan of the Engineering Division, on farm use of irrigation water. Others cover a wide range of research interests.

**Sagebrush Control on Rangelands.** BY JOSEPH F. PECHANEC, A. PERRY PLUMMER, JOSEPH H. ROBERTSON, AND A. C. HULL, JR. 1965. *USDA Agr. Hbk.* 277. 40 pp., illus. A well-illustrated handbook on methods of controlling sagebrush, management of ranges after sagebrush control, and a listing of common and scientific names of the plant species. Supersedes Farmers' Bulletin 2072.

**Conservation Methods for Soils of the Ontario-Mohawk Plain and Glaciated Allegheny Plateau.** BY G. R. FREE. 1965. *USDA Agr. Inf. Bul.* 291. 16 pp., illus. Information giving general description of the area; conservation problems; effect of topography, soils, and seasons on runoff and erosion; and soil and water management practices for conservation.

**Pesticides Documentation Bulletin. Volume 1, Number 1.** March 19, 1965. *USDA. National Agricultural Library*. 156 pp. Biweekly. A computer-produced inventory of current literature on pesticides. Free on request to libraries, educational and scientific institutions, Federal and State officials, and others. Subscription \$12 a year domestic, \$15 foreign.

**Agronomy in the Americas.** 1964. *American Society of Agronomy, Madison, Wis. ASA Spec. Pub.* 2. 60 pp. \$1. A symposium presented at the 1963 annual meeting of ASA. The papers discuss various aspects of agricultural research, extension, and education in Latin America and relations to the United States.

**Income Opportunities for Rural Families From Outdoor Recreation Enterprises.** BY RONALD BIRD AND BUIS T. INMAN. 1965. *USDA Agr. Econ. Rpt.* 68. 31 pp. Summarization of data from studies on recreational enterprises in Arkansas, Missouri, New England, Ohio, Oregon, and South Carolina.

**Quest for Quality.** 1965. *U. S. Department of the Interior*. 96 pp., illus.; color. \$1. Subtitled "Conservation Yearbook," this outsize publication states the conservation goals and describes the activities of the bureaus of the Department of the Interior.

**Protecting Shade Trees during Home Construction.** BY AGRICULTURAL RESEARCH SERVICE. 1965. *USDA Home and Garden Bul.* 104. 8 pp., illus. Suggestions on evaluating trees and hints for protecting them.

**Chemical Control of Brush and Trees.** BY AGRICULTURAL RESEARCH SERVICE. 1964. *USDA Farmers' Bul.* 2158. 23 pp., illus. Up-to-date information on herbicides and their application.

**Usual Planting and Harvesting Dates.** BY STATISTICAL REPORTING SERVICE. 1965. *USDA Agr. Hbk.* 283. 84 pp., maps. Field and seed crops, by States in principal producing areas.

**Herbicide Manual for Noncropland Weeds.** BY R. S. DUNHAM. 1965. *USDA Agr. Bbk.* 269. 90 pp. ♦

In the 1700's there were 600 acres of land for every man, woman, and child. Today, there are 13 acres, and in 25 years there will be only 8 acres. ♦



From the Administrator:

## *The Cost of Sediment*

**E**VERY year sedimentation—a byproduct of soil erosion—costs us dearly.

More than 737 million acres of non-Federal land in rural America is susceptible to erosion. This land is a potential source of sediment that runs off into streams, limits storage capacity of reservoirs, plugs stream channels causing them to overflow, pollutes our water, and brings about untold damage and destruction.

Large-scale suburban construction also feeds silt into streams when soil is left bare and exposed to rains and subsequent erosion. Most suburban developers do not think in terms of soil and water conservation. Yet land in areas they are developing may be exposed anywhere from a few months to 2 or 3 years, and it needs protection during that time.

Highway construction, crisscrossing the Nation, opens up large areas of land to the mercy of the rain and wind. It is true that today roadside erosion control and beautification are often part of highway planning. Unfortunately, however, the plans do not usually include soil conservation work early in the construction stage. Yet this is when temporary vegetation and other conservation measures are needed if the area is not to become a sediment source.

If soil erosion is not controlled—in city, town, or country—sediment reaches our reservoirs and streams, where it has become the largest single pollutant. Nor can railroads and highways, recreation areas, sewerlines and wells, or airports escape. And sediment enters homes, stores, and factories with the swirling water of floods. They too are victims when land is left unprotected.

Many of our streams—once

scenes of unmatched beauty for all to enjoy and affording relaxation to the fisherman and swimmer—now are shameful sights. Sediment and other pollutants have made them unfit for human use and uninhabitable by game fish.

Much to our chagrin in the Nation's Capital, the Potomac is one of those rivers. President Lyndon B. Johnson has appealed for an all-out campaign to clear up the Potomac and keep it clean. He hopes to see it become "a model of scenic and recreation values for the entire country." I look forward to the SCS taking a part in this campaign.

If a program to rid our streams of pollution is to be successful—on the Potomac or elsewhere—it must include control of soil erosion as well as control of industrial chemicals and urban waste. And sedimentation from nonfarm rural and urban land becomes more of a problem as city, industrial, and highway construction spreads out.

To deal with the sedimentation and pollution problems may require local land use and building regulations based on soil and water conservation planning. It may call for regulations requiring temporary conservation measures during lengthy construction operations. Certainly local planners will need to work closely with soil conservation specialists. For erosion control should be as much a part of urban planning as sewage disposal and water supply.

Congressmen have shown their concern where rapid urbanization is taking place. They urge that the Department of Agriculture be authorized to cooperate with local people in protecting and developing the soil and water resources of such areas.

The Soil Conservation Service

has been helping farmers do this successfully for 30 years. More recently we have been helping suburban planners, builders, and other nonfarm land users. But far too few recognize that conservation should be basic to all land use and development, no matter where. The same skills and techniques that farmers have proved sound can be adapted for use on nonfarm lands.

These are some of the sedimentation problems our Nation faces today. They are serious problems. They affect everyone. The cost of apathy is tremendous for everyone is a taxpayer. The cost, of course, cannot be figured in monetary values alone, for no one can pay for the loss of land and water.

The average citizen, however, is not likely to connect readily the need for erosion control upstream with the inconveniences and cost that result from the aftermath of that erosion.

There is urgent need for action. What that action will be must be decided by local people. The Soil Conservation Service provides help through soil and water conservation districts, watershed projects, soil surveys, and other conservation programs.

Ultimately, the job rests upon the shoulders of those who plan for the use and care of our land and water resources. It is up to them to see that careful plans are made—and carried out—for the conservation and protection of these resources on every acre of our Nation.

However, if the responsible people are to do the job, all citizens must become aware of the seriousness of the problem and recognize its source. Finally, they must give their active support to its solution.

—D. A. WILLIAMS



If your address changes, please notify us of your complete new address, including Zip Code number and include old address with our code number as shown above.

## Recreation and Livestock Make a Happy Combination

**T**HE Joe Mannings of North Dakota joined the golfing world when they converted 100 acres of valley land on their farm near Hettinger to a nine-hole golf course.

In addition to the course, they built a small landing strip for light planes, a driving range, and a picnic area, and left ample room for softball and horseshoe pitching. A tennis court and swimming pool are in the Manning plans. And they still keep livestock on their rangeland.

They decided on the change 3 years ago when fire destroyed the Hettinger Golf Club.

Mr. Manning had considered developing the valley land on his farm for recreation. Now, he thought, was his chance. His single-row windbreaks and the strips of land between them, planted according to a conservation plan in cooperation with the Adams County Soil Conservation District, seemed perfect for a golf course. He would not have to cut a tree, and the other facilities would round out a pleasant group of activities for prospective club members.

His clubhouse is unusual. Well and basement were dug by experi-

enced crews, but most of the other work was done by the Mannings and their neighbors.

Mrs. Manning supervises the kitchen and dining room. Those facilities are much in demand. Here, too, the three young Manning daughters and a son lend a willing hand, and the son also helps with the rest of the farm.

Of course, there is indebtedness which must be retired, but Mr. Manning has no real worry about that. Early response has been good, and he is sure it will grow. There are 107 members of the club now. They joined at \$40 each, half

of them nongolfers who wanted only the social privileges of the club.

The Manning cropland is in the Conservation Reserve, and there income from the livestock.

He and the others in the family are thoroughly enjoying themselves. They like people, and the club members like them. It has turned out to be a most satisfactory change that the Mannings made—and indications are it will be comfortably profitable, too. — GILBERT F. SCHWANDT, *Work Unit Conservationist, SCS, New England, N. Dak.* ♦



Joe Manning developed this golf course to supplement his farm income.



1.6  
5035

class

# SOIL CONSERVATION

Index

VOLUME XXX

August 1964 to July 1965



UNITED STATES DEPARTMENT OF AGRICULTURE

Issued March 1966

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402 - Price 15 cents (single copy).  
Subscription Price: \$1.75 per year; 75 cents additional for foreign mailing. Index issues vary in price. This issue 10 cents.

1800  
3040



UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

SOIL CONSERVATION—INDEX TO VOLUME XXX

AUGUST 1964 to JULY 1965

	Page		Page
ACHTERMANN, ADRIAN: Ohio Agency Gives Wildlife Award-----	185	Alabama—	
Act(s)—		Appalachia-----	221
Appalachian Regional Development-----	221	club and district sponsor Soil Stewardship-Week-----	226
Economic Opportunity-----	189	Greene County SCD conducts "Know Your Soil" campaign-----	256
Food and Agriculture 1962 gave USDA responsibility for Resource Conservation and Development projects-----	127	springs and seeps answer to water supply problem-----	96
Land and Water Conservation Fund for public and private land for recreation-----	161-162	Alaska—	
Town Conservation Commissions (Mass.)--	27	Agriculture, a Shock to. William B. Oliver..	30-31
Adams, Lonnie, developing floodwater spreading systems (Mont.)-----	261	homesteading and agriculture-----	33
Adams, Marmion and Dave, practice reduced tillage (Iowa)-----	105	Algeria—	
Agency for International Development—administers and coordinates programs-----	3	operations by SCS, 1964-----	140
contractual agreement with SCS-----	140	SCS applies simple conservation practices in -----	4
Agricultural Research Service—		SCS assisting government programs-----	3
research specialist, Tunisia-----	4	ALLAN, DAVID N.: Many New Landowners and Farmers Plant Shrubs for Wildlife-----	183-184
wind erosion equation-----	107-108	American Forestry—	
Agricultural Stabilization and Conservation Service—		Association Sponsors Multiple Use Conservation. Kenneth B. Pomeroy-----	67
assisting in Rural Areas Development Program (Ark.)-----	13	Conservation Program-----	71
committee, emergency cost-sharing practices for debris removal (Alaska)-----	31	Conservation Program policy statement-----	51
cost-shared costly drainage (Ohio)-----	14	ANDERSON, R. D.: Pleasure and Profit From Ranch Resources. With Willis Hammond and Richard Porter-----	240
cost-sharing assistance (Colo.)-----	96	Animal-Unit Leases Help Balance Grazing on Pilot Rock Range. Edgar Baumann and Bud Lemmons-----	209-210
Granted additional money to projects for landowners needing water (Ohio)-----	66	annual report of Soil Conservation Service, 1964-----	133-140
helped finance irrigation (N. Mex.)-----	131	Appalachia—	
increased cost-share rate for adapted varieties of grass-----	58	A Look at-----	267
participates in RC&D project activities-----	127	a trouble spot-----	244
provided special help for farmers, Clark Fork (Mont.)-----	59	Action in-----	221-223
shared cost of improving woodlot (Ohio)--	280	The Challenge of. D. A. Williams-----	263
sponsors tree-planting practice (Tenn.)-----	251	In Perspective. Glendon P. Burton and Ross Mellinger-----	271-273
Agriculture, Department of, co-partners in river basin planning-----	136	Its Problems. Robert H. Marcum. 268-269, 282-283	
agronomy, progress in 1964-----	139	The Program. Robert W. Oertel-----	270-271
AHERN, MAURICE E.: Grasses Used in Crop-land Shifts-----	235	Area Redevelopment Administration loaned for Lewisburg water supply-----	10
airplane used to spray sagebrush (Utah)-----	144	Arizona—	
Airport Conservation Makes Good Neighbors. Bernhard A. Roth-----	36-39	Annual Youth Conservation Camp-----	175-176
		Lehmann lovegrass-----	6
		Migrant Ministry enlisting people into programs to obtain equal economic opportunity-----	220



	Page		Page
Arkansas—		Belknap, Burton, nature trail (N.Y.)-----	177
Broadens District Powers-----	258	BELL, DONALD W.: Scouts Serve Community, Earn Badges by Helping Install Watershed Project -----	211
district sponsored essay contests-----	42	Bell, Harry W.: Sediment Threat Stirs Landowners. With Richard D. Jiskra-----	68
11th National Watershed Congress held in Little Rock-----	9	BERG, NORMAN A.: Great Plains Conservation Meets a Regional Problem-----	248-250
Six-Mile Creek watershed reduced cropland-----	196	Bicolor Guards Rights-of-way-----	11
Sunset Community Rural Areas Develop- ment-----	12	Bidenharn, Bernard and Betty, pump Rocky Fork Branch (La.)-----	254
Army, Department of—		BILLINGS, WILLIAM H.: Nursery Alternates Trees and Cattle in Same Fields. With B. H. Rountree-----	116
co-partner in river basin planning-----	136	Biology, progress in 1964-----	139
ATKINS, M. D.: The Search for "Ecotypes"---	58	BOEKING, R. H.: SCD Buys and Restores Farm to Demonstrate Good Practices-----	234-235
Award(s)—		BOLLMAN, ROBERT V.: Chisel Plow Reduces Erosion. With Ernest E. Behn-----	105
FFA won by Robert Hendershot (Ohio)---	141	BOWEN, RICHARD B.: Northern Rio Grande RC&D Project Awakens Area-----	131-132
New, Program Supports 4-H Club Conserva- tion Project. E. J. Williamson-----	81	Boy Scout(s)—	
Study Area Wins SCSA Merit-----	81	Get Conservation Lessons. John M. Cross--	189
USDA Council Conservation Award to De- troit Area Council, Scouts-----	17	National Council Hornaday Award-----	19
Wildlife Conservation Award given to Lyn Newnham (Ohio)-----	185	Serve Community, Earn Badges by Helping Install Watershed Project. Donald W. Bell -----	211
William T. Hornaday Award to Eagle Scout Jeff Harms (S. Dak.)-----	19	Sixth National Jamboree at Valley Forge---	84
Aycock, John, full-time conservation farmer since retired from SCS (Tenn.)-----	285	use old Christmas trees to control soil and water losses (Mont.)-----	154
BAILEY, GEORGE E.: More and Better Grass Pays in Great Plains. With Carl S. Fonte--	168	Brady's Hills Ski Area. James M. Cooper and Merrill D. Ray-----	55-57
bargraph on conservation photo (Pa.) repre- sents extent of four major conservation problems. Cover picture-----	[242]	BRIGGS, SHIRLEY A.: Natural History So- cieties. With John Vosburgh-----	92-93
BARNARD, JOHN W.—		BROWN, GEORGE S.: Solving Playground Prob- lems Part of District Program-----	39-40
Opportunities in Resource Development----	127-128	BROWN, LEO: Bluestem Grass in a Black Wrapper. With Sy Ekart-----	186
Review of "Planning Our Town"-----	214	BROWN, SILAS W.: Trees Planted on Shaft Mining Land-----	154
BATHURST, VERNE M.: Soil Erosion in Urban Areas-----	274-275	BROWN, WILLIAM F.: Agencies, Landowners Join Efforts to Improve Ditch. With Richard W. Rush-----	14
BATTLES, JOHN: Plow-Planting for Fewest Trips -----	105	Brush Control—	
BAUMANN, EDGAR: Animal-Unit Leases Help Balance Grazing on Pilot Rock Range. With Bud Lemmons-----	209-210	by mechanical and chemical methods (Tex.)-----	150-152
Beautification—		most widespread practice applied with cost- sharing assistance-----	250
and recreation on Rocky Ford Branch (La.)-----	254	BURTON, GLENDON P.: A Look at Appalachia in Perspective. With Ross Mellinger-----	271-273
in Appalachia (W. Va.)-----	273	Busse, Mel, constructed a lake and golf course (Wis.) -----	212
Beauty—		California—	
and Conservation. Lyndon B. Johnson and Orville L. Freeman-----	213-214	Central Sonoma watershed had special pro- visions for fish-----	173
new landowners (N.H.) think plants are a thing of-----	183	Goars tall fescue, Los Banos trefoil-----	6
picture story illustrating parts of White House Message on Natural-----	227-230	Monterey pines for Christmas trees-----	117
Preservation of Natural. Gladwin E. Young -----	165	orchardist came up with a golf course-----	32
Roadside, and Safety. L. D. Eagles and O. S. Kirkpatrick -----	111-112	Plant Center gave Lana its name-----	152
rural -----	95	Cameron, J. B., and Jim, scheduled grass seed- ing (Kans.)-----	284
Russian-olive for many kinds of landscape plantings-----	231		
windbreaks planted by farmers and ranchers along interstate highway (N. Dak.)-----	225		
Behind the Scenes on a Watershed Construc- tion Job. Paul E. Nylander-----	202-206		
BEHN, ERNEST E.: Chisel Plow Reduces Erosion. With Robert V. Bollman-----	105		



	Page		Page
Camp Conservation Wins Scout Council Award .....	17-18	Conservation—Continued	
camp on conservation for young first-of-fenders (Mich.) .....	223	plan joint project between school and farmer (N.Y.) .....	39
Capital Residents Get Field Course in Natural History, conservation .....	45	Therapy. Donald D. Kline .....	223-224
Carlisle, Mahlon, woodland (Ohio) .....	280	Unified Planning. Benjamin Isgur .....	27-29, 45
Cattle—		Work Wins FFA Award. Pearl L. Fogle .....	141
Drive, A Modern. Dwaine C. Smith and Herbert R. Davis .....	155-158	Your Community and You .....	84-86
larger calves on animal-range leasing (Oreg.) .....	209	Conservationists All .....	19
on one side of nursery, trees on other .....	116	Conservation Needs Inventory—	
Center—		data from 1964 .....	140
nature, Ghost Ranch Museum (N. Mex.) .....	78-81	indicated foothill grazing land where Lana vetch can be used .....	8
Plains Conservation (Colo.) .....	81	points up problems facing SCS .....	243
Church in Resource Conservation and Development. Dr. Henry A. McCanna .....	219-220	proved woodland improvement being neglected by landowners (Ohio) .....	280
Civil Rights Act, Rural Beauty. D. A. Williams .....	95	showed the job still to be done in the Great Plains .....	269
CLAUSEN, ERLING W.: Outdoor Laboratory Builds Interest in All Studies .....	82-83	Shows Dimensions of the Job .....	245-247
Colorado—		Contractor(s)—	
earthmoving .....	96	digging channels in watershed (Minn.) .....	15
gradient ditches in Cedar Draw, Cataract Ditch .....	281	Help Speed Woodland Improvement in Northeastern Ohio. Paul A. Dodd .....	280
grass, water, wildlife contribute to success of ranch .....	240	on Holderman Ditch job (Ohio) .....	14
irrigated land leveled .....	42	COOPER, JAMES M.: Brady's Hills Ski Area. With Merrill D. Ray .....	55-57
Never Summer Ranch favorite spot for vacationers .....	202	COTTON, JAMES A.: Soil Display Boards Aid "Know Your Soil" Campaign. With Luther E. Gowder .....	256
pays to reseed submarginal cropland to grass .....	168	Coxe, Francis, of S. C., District Profile .....	21-22
State reformatory site of a unique irrigation system .....	188	CRATTY, ARTHUR H.: Icelandic State Park Makes Good Use of Watershed Lake .....	259
terraced and contoured field after a light snow .....	188	CROOK, A. G.: State Reformatory Is Site of Unique Pipeline .....	188
Tomichie Ranch demonstrates range rehabilitation on private and public land .....	159	Cropland(s)—	
West Arapahoe SCD received SCSA award .....	81	Conservation Program requires work on ecotypes .....	58
Yuma Pheasant Association .....	178	Conversion Program used to fullest extent in furthering RC&D objectives .....	128
Committee for coordinating fish and wildlife conservation .....	40	conversion progress, 1964 .....	134
Companies—		reduced by land use conversions .....	196
Georgia-Pacific Corp. benefited by per-animal range leasing (Oreg.) .....	209	CROSS, JOHN M.—	
Thorofare and Locust Island Meadows (N.J.) .....	179-182	Pampered Stream Responds With Beauty and Utility. With Jimmie Wyche .....	254
COMPTON, LAWRENCE V.—		Scouts Get Conservation Lessons .....	189
Review of "Tomorrow's Wilderness" .....	69	Crow Wing Canoe Trail .....	123-125
Review of "Wildlife Management and Conservation" .....	190	DALE, TOM: Review of Farmer's World. The Yearbook of Agriculture .....	118
condition classes for range .....	149	DAVIES, CHARLES E.: Conservation Makes a Showplace of Farm .....	96
Conservation—		DAVIS, HERBERT, R.: A Modern Cattle Drive. With Dwaine C. Smith .....	155-158
Design Tames the Old Cataract Ditch. Neal P. McKinstry .....	281-282	DAVISON, VERNE E.: Attract Birds and Other Wildlife to Rural Areas. With Roy A. Grizzell .....	88-89
Essay Winners .....	42	De Los, Mr. and Mrs., developed recreation ponds (Ill.) .....	16
Makes Showplace of Farm. Charles E. Davies .....	96	Delta District Cooperators Mechanize Sugarcane Planting .....	233
Plan Converts Cropland to Grass. Larry Van Berkom .....	236	diary of an SCS construction engineer .....	203-206
Plan for County Roadsides. George R. Peeples .....	163	DILLON, OLAN W., JR.: Russian-Olive Is Prize Landscape Plant in West .....	231-232



	Page		Page
District of Columbia—		Education—Continued	
urbanized downstream two-thirds of Rock		pond an outdoor laboratory (Ill.)-----	197
Creek watershed-----	275	school building exhibit show larger school	
Washington Examining Board-----	140	sites for outdoor-----	187
Ditch(es)—		EKART, SY: Bluestem Grass in a Black Wrap-	
Agencies, Landowners Join Efforts to Im-		per. With Leo Brown-----	186
prove. Richard W. Rush and William		Engineers, U.S. Corps of, closely assisted by	
Brown-----	14	Highway Department on highways-----	43
gradient in Cedar Draw, Cataract Ditch		engineering progress in 1964-----	140
(Colo.)-----	281	ENGLE, EDWIN P.: Rancher Makes Showplace	
DODD, PAUL A: Contractors Help Speed		on Private, Public Land. With John	
Woodland Improvement in Northeastern		O'Hayre-----	159
Ohio-----	280	Equipment—	
DOMPIER, LENN: Farm Pond Serves Fire		grain drill for pilot planting on highway--	111
Protection and Recreation-----	19	landscaper used to sod waterways (Maine)--	113
Drainage—		erosion problems exist in Appalachia (Ky.)--	269
ditch fiber glass matting (Mo.)-----	43	Farm—	
Holderman outlet ditch problem solved		demonstration, bought and restored by	
(Ohio)-----	14	Scotts Bluffs District (Nebr.)-----	234-235
survey for Sunset Community (Ark.)-----	12	Game—Conservation Districts—Wildlife for	
drought in Great Plains-----	248-250	Everyone. D. A. Williams-----	191
Duffin, Russ and Jack, pond outdoor labora-		Farmer Cooperative Service participates in	
tory-----	197	RC&D project activities-----	127
Durley, Chester, helped Sunset Community--	12	Farmers Home Administration—	
DYER, E. B.: Tennessee Community School		Lake-Locust Island Project (N.J.)-----	179
Provides a Study in Conservation at Work--	283-284	loan to fruit growers association (N. Mex.)--	132
DYKES, J. C.: The Unfinished Job-----	243-245	made available emergency loans (Alaska)--	31
EAGLES, L. D.: Roadside Beauty and Safety.		participates in RC&D project activities----	127
With O. S. Kirpatrick-----	111-112	provided special help for farmers, Clark	
EARLE, J. B.: Police Juries Boost Small Wa-		Fork (Mont.)-----	59
tershed Activity-----	207-208	Farmer's Nature Trail. Frank Leavitt-----	177
Earthmoving—		Farmers Plant Trees to Beautify New Inter-	
for leveling fields (Colo.)-----	96	state Highway Route. Elmer L. Worthing-	
present unique problems, Chippewa River		ton-----	225-226
Tributaries and Hawk Creek watershed		Farmland To Recreation and Homes. Harold	
(Minn.)-----	15	B. Porter-----	212
earthquake damage to agriculture (Alaska)--	30-31	FARNES, P. E.: SCS Helps Repair Land Dam-	
Economic(s)—		aged by Montana Flood-----	41
grazing and recreation on ranch profitable--	240	Federal Extension Service participates in	
income from herd to offset cropland reduc-		RC&D project activities-----	127
tion (N. Dak.)-----	236	Ferrier, Frank, sinkhole pond (Va.)-----	115
recreation combined with grassland farming		fire protection from farm pond (Wash.)-----	19
to bolster farm profits-----	276	fish migratory habitat requirements in water-	
restored farm incomes and profitable musk-		shed plans, Skipanon River (Oreg.)-----	172
rat trapping, Hancock Bridge (N.J.)----	180	FISHER, JAMES R.: Large Floodways Present	
returns from Christmas trees profitable---	117	Problems in Construction-----	15-16
Economic Research Service—		Fletcher, John and Stan, developed soil con-	
analysis shows Arkansas cropland reduced--	196	servation plan-----	42
helps conduct river basin surveys-----	136	Flood(s)—	
participates in RC&D project activities----	127	historical data used for highways (Mo.)----	43
Ecotypes, the Search for. M. D. Atkins-----	58	in Montana makes urgent needed land use	
EDMINSTER, FRANK C.: Quality in Outdoor		changes and complete watershed treat-	
Recreation-----	87	ment-----	41
Education—		prevented by Roanoke Creek watershed	
Annual Youth Conservation Camp (Ariz.)--	175-176	(Miss.)-----	199-201
Camp Salem for Boy Scouts (La.)-----	189	Floodways, Large, Present Problems in Con-	
Grange Conservation Tour for 8th grade		struction. James R. Fisher-----	15-16
groups (Mont.)-----	186	Florida—	
outdoor laboratory at Moravia Central		creeping bluestem, Arcadia Plant Materials	
(N.Y.)-----	185	Center-----	106
outdoor laboratory, Unaka school (Tenn.)--	283-284	Taming Wild Wells in. Donald E. Vander-	
outdoor schoolroom (N. H.)-----	184	grift-----	257-258



	Page		Page
FOGLE, PEARL L.: Conservation Work Wins FFA Award.....	141	Grass(es)—Continued	
FONTE, CARL S.: More and Better Grass Pays in Great Plains. With George E. Bailey---	168	Lehmann, lovegrass, tall fescue, Los Banos trefoil, Siberian wheatgrass, etc.....	6
Forest Service—		More and Better, Pays in Great Plains. George E. Bailey and Carl S. Fonte.....	168
assisted with planting of trees (Ark.)-----	10	New, for the Southeast. W. C. Young and H. L. Leithead.....	106-107
combined with others on Boy Scout Jam-boree .....	84	of importance in the Plains.....	58
dedicated tract to recreation, Holly Springs (Miss.) .....	198	on uplands on SCS retiree farm (Tenn.)---	285
helps conduct river basin surveys.....	136	paille fine for marshlands (La.).....	279
manager of National Forests.....	71	Pensacola bahiagrass for highways.....	111
participates in RC&D project activities.....	127	Seeding Pays off on Kansas Estate. Arthur W. Pope.....	284-285
provided instructors for Grange Conservation Tour (Mont.).....	186	Used in Cropland Shifts. Maurice E. Ahern .....	235
provided special help for farmers, Clark Fork (Mont.).....	59	Gravity Flow Sprinkler System for Foothill Irrigation .....	90-91
4-H Club conservation project.....	81	Grazing Native Grass Proves Conservation Use of Fresh Marsh. Thomas N. Shiflet---	279
FREEMAN, DANNY: Youth Conservation Camp. 175-176		Great Plains—	
FREEMAN, ORVILLE L.: Natural Beauty and Conservation. From address to Minnesota Conservation Federation.....	212-214	Conservation Meets a Regional Problem. Norman A. Berg.....	248-250
Fry, James E., leveled his fields.....	96	short grass country, a trouble spot.....	244
FULLER, LEWIS: Grange Tour Shows Conservation .....	186	Snowscape .....	188
funds from admission and user fees, taxes, net proceeds from sales.....	161	States 1963-64 wind erosion statistics.....	46
Future Farmers of America given space at the outdoor laboratory (N.Y.).....	185	wind erosion curves.....	108
Georgia—		Great Plains Conservation Program—	
Appalachia .....	221	a pilot program given authorization of millions of dollars.....	250
Appalachian Regional Development Act....	270-271	cost-shares Kent Creek watershed (Tex.)..	118
Gwinnet County RC&D, undergoing rapid change from agriculture to urban.....	129	first cooperator in Adams Co. (Colo.)---	96
J. Irwin Davis. District Profile.....	260-261	floodwater spreading systems (Mont.)---	261
stabilizing backslopes on roadbanks.....	163	gains in fiscal year 1964.....	109
switchgrasses at Americus Plant Materials Center .....	106	half of land in drainage above floodwater-retarding structures (Nebr.).....	68
Ghost Ranch Museum.....	78-81	increased cost-share rate for adapted varieties of grass.....	58
Goddard, R. Guy, appreciates outdoors (S. Dak.) .....	255	planted sorghum and left stubble (Colo.)---	168
Golf Balls and Barbecue Replace Apricots. Robert F. Tegner.....	32	progress for 1964.....	136-137
GOWDER, LUTHER E.: Soil Display Boards Aid "Know Your Soil" Campaign. With James A. Cotton.....	256	scheduled grass seeding, Graham County (Kans.) .....	284
GRAHAM, EDWARD H.: SCS Goes Abroad....	3-5, 20	Great Society, Technical Guides, Keeping Up. D. A. Williams.....	119
Graham, Jewell, Mud River Conservancy District (Ky.).....	9	GRIZZELL, ROY A.: Attract Birds and Other Wildlife to Rural Areas. With Verne E. Davison .....	88-89
Grange Tour Shows Conservation. Lewis Fuller .....	186	Grundy Experimental Farm (Iowa). Cover picture .....	[99]
Grass(es)—		GUERNSEY, WALTER J.: Narrow Strips, Grass Cover Wins Favor With Farmers.....	160-161
and sericea lespedeza on roadbanks (Ga.)--	163	Gully (ies)—	
Bluestem in a Black Wrapper. Sy Ekart and Leo Brown.....	186	in Cedar Draw, Cataract Ditch (Colo.)---	281
cover adopted by tobacco farmers (Ky.)---	236	plugged by Christmas trees (Mont.)---	154
cropland converted to (N. Dak.).....	236	GUTHRIE, HELEN, MRS.: Litterbugging.....	188
floodwater-spreading system dikes seeded to western wheatgrass (Mont.).....	261		
Improves Highway Scenes (S.C.).....	120	HAFENRICHTER, A. L.: New Conservation Plants in the West.....	6-8
land infested by brush (Tex.).....	150	HAMMOND, WILLIS: Pleasure and Profit From Ranch Resources. With Richard Porter and R. D. Anderson.....	240
		HANCHETT, EUGENE C.: Life for White River Area .....	126



Harms, Jeff, receives Hornaday Award (S. Dak.) -----	Page 19	Iowa—	Page
HARPER, CHARLES N.: Clubs and Schools Join Churches in Soil Stewardship-----	226	county soil surveys aid assessors in valuing agricultural land for tax purposes-----	109
harvest time. Cover picture. (Wash.)-----	[1]	Farmers Find Self Help Pays Off. Jim Mander -----	141
HAYES, WILLIAM A.: Minimum Tillage for Potatoes. With Clifford Roy-----	103-104	Grundy Experimental Farm. Cover picture -----	[99]
Health, Education, and Welfare, Department of—co-partner in river basin planning-----	136	reduced tillage, chisel plow-----	105
HEARD, W. L.: Teamwork at Holly Springs-----	198-199	Starmont High School, 80 acres includes outdoor education-----	187
Hendershot, Robert E., FFA award (Ohio)---	141	Irrigation—	
HENNINGER, C. M.: Lumber Is Our Crop-----	53-55	farm bought and restored by Scotts Bluff District (Nebr.)-----	234-235
Heritage for Our Descendants—a Conservation Challenge From the White House Message on Natural Beauty-----	227-230	gravity-flow sprinkler system-----	90
Highway(s)—		siphon for water for State reformatory-----	188
Appalachian development highway system--	222	systems rebuilt increases dairy output-----	285
Appalachian System (Ga.)-----	271	water management after leveling-----	42
construction exposed large areas to mercy of rain and wind-----	287	ISGUR, BENJAMIN: Unified Conservation Planning -----	27-29, 45
field windbreaks and wildlife plantings along interstate (N. Dak.)-----	225	JACKSON, DELBERT E.: Lazy 6 Lakes Fishing Area Brings Cash, Fun for Owner-----	16
grass for scenic beauty-----	111	Jewish farmers all over world pioneered in techniques of soil conservation-----	220
State. Construction and Soil and Water Conservation. M. J. Snider-----	43-44	JISKRA, RICHARD D.: Sediment Threat Stirs Landowners. With Harry W. Bell-----	68
HILL, MICHAEL D. Soil Conservation in Alaska -----	33-35	JOHNSON, LYNDON B.: Natural Beauty and Conservation. From White House Message to Congress on Natural Beauty-----	213
Hillewaert, John, Frank, and Alphonso, use gradient ditches (Colo.)-----	281	JONES, T. F.: What Do Retired Conservationists Do?-----	285
Holly Springs, Teamwork at. W. L. Heard--	198-199	Julien, Leonard and Harold, invented a mechanical sugarcane planter (La.)-----	233
Holzwarth, John and Mrs., operate Never Summer Ranch (Colo.)-----	202	Julley, William, followed through on fire protection -----	19
HORTIN, JOHN K.: Sagebrush Gives Way to Tall Grass-----	144	Kansas—	
Houck, Roy, cattle drive (S. Dak.)-----	155	bluestem grass-----	186
Howard, Mrs. William B., combines outdoor recreation with grassland farming (Md.)--	276	SCS specialist, Orleansville, Algeria-----	5
Huff, S. B., planted loblolly seedlings (S.C.)--	201	seeding native grasses on eroded cropland, Rice Estate-----	284
Icelandic State Park Makes Good Use of Watershed Lake. Arthur H. Cratty-----	259	Kentucky—	
Idaho—		Appalachia -----	221
cows score from sound pasture management and irrigation systems-----	285	counties included in Appalachian Region--	268
gravity-flow sprinkler system-----	90	Mud River Watershed Project-----	9
Northern panhandle RC&D unique features -----	130	narrow stripcropping and grass cover-----	160
stripcropping -----	105	Key Goals for Conservation. T. B. Plair-----	51, 52, 68
Twin Falls SCD, seed production industry--	6	KEYES, WILLIAM J.: Minimum Tillage for Corn and Soybeans-----	103-104
Illinois—		Kimsey, Floyd, Oren, and Deyo, sell lumber not standing timber (Tenn.)-----	53
Lazy 6 Lakes fishing-----	16	KINDER, GEORGE: A Pond Is a Place of Many Delights -----	197
minimum tillage for corn and soybeans-----	103	KIRKPATRICK, O. S.: Roadside Beauty and Safety. With L. D. Eagles-----	111-112
pond an outdoor laboratory as well as source for livestock-----	197	KLINE, DONALD D.: Conservation Therapy---	223-224
shaft-mining, Madison Coal Co-----	154	KOERNER, ROBERT O.: Sportsman Makes Wildlife Haven of His South Dakota Farm-----	255-256
Indiana—		Korea, water leveling-----	67
Lincoln Hills RC&D, unique features-----	129	Lana: A Vetch for the West. H. W. Miller--	152-154
Information, Office of, participates in RC&D project activities-----	127	Land—	
Interior, Department of, co-partner in river basin planning-----	136	and Water Conservation Fund Can Aid Local Recreation Plans. Henry F. Nichol--	161-162
International Voluntary Service provides assistance to SCS, Algeria-----	5		



Land—Continued	Page	Manning, Joe, converted valley land to golf course (N. Dak.)	Page
clearing widest applied practice in Alaska	35	maps, range	149
converted to grass (N. Dak.)	236	MARCUM, ROBERT H.: A Look at Appalachia—Its Problems	268-269, 282-283
Damaged by Wind Erosion in Great Plains	46	MARRIAGE, L. DEAN: Hope for Salmon and Steelhead	171-173
Leveling Is Investment for Ranchers.		marshland, grazing on paille fine (La.)	279
Bruce A. Lindahl	42	Maryland—	
owners and Farmers Plan Shrubs for Wildlife, Many New. David N. Allan	183-184	Appalachia	221
owners make an impressive contribution of their own resources	250	Loch Raven Reservoir survey showed land treatment program reduced sediment	196
resource sections in whole State represented in outdoor laboratory (N.J.)	82	National Cartographic Laboratory	23
shift from cropland to grass	167	Urban Farm Thrives on Double Duty Land Use	276-278
shift from crops to trees (Tenn.)	53	watershed under complete conservation treatment. Cover picture	[218]
Treatment Gets Emphasis. Joe B. Norris	118	Massachusetts conservation commissions for urban programs	27
Treatment—What Districts Do. D. A. Williams	215	McCANNA, DR. HENRY A.: The Church in Resource Conservation and Development	219-220
use adjustment for economic improvement in Appalachia	222	McCrane, Mrs. Emma, follows a conservation plan (Colo.)	240
use conversions and treatment measures essential on watershed lands	196	McKINSTRY, NEAL P.: Conservation Design Tames the Old Cataract Ditch	281-282
Land Management, Bureau of, assists landowner make an inventory of his range resources	159	McRaney, Rev. J. A., builds farm and church	232
LARSON, E. JOSEPH: New Soil Classification	99-102	MELLINGER, ROSS: A Look at Appalachia in Perspective. With Glendon P. Burton	271-273
Lazy 6 Lakes Fishing Area Brings Cash, Fun for Owner. Delbert E. Jackson	16	Michigan—	
LEAVITT, FRANK: A Farmer's Nature Trail	177	Central Montcalm School under a conservation plan	192
Legume(s)—		Charles Howell Scout Reservation	17
Lana vetch	152	first-offense young men work at conservation projects	223
Lana vetch for rangeland	7	Gwinn Public Schools, conservation plan includes woodland for a day camp	187
LEITHEAD, H. L.: New Grasses for the Southeast. With W. C. Young	106-107	pastor stimulated concern for hungry people of the world	219-220
LEMMON, PAUL E.: Soils Information for Woodland Planning	63-64	ski area, Brady's Hill	55
LEMMONS, BUD: Animal-Unit Leases Help Balance Grazing on Pilot Rock Range. With Edgar Baumann	209-210	MILLER, H. W.: Lana: A Vetch for the West	152-154
LINDAHL, BRUCE A.: Land Leveling Is Investment for Ranchers	42	Minimum Tillage—For Corn and Soybeans. William J. Keyes. For Potatoes. William A. Hayes and Clifford Roy	103-104
LIPMAN, RABBI EUGENE J.: Through the Centuries	220	Minister Builds Farm and Church. W. C. Nelms	232
Litterbugging. Mrs. Helen Guthrie	188	Minnesota—	
LONG, LARRY H.: Mechanical Sodding Method Solves Waterway Problem	113-114	Chippewa River Tributaries and Hawk Creek watershed floodway improvement	15
Louisiana—		Crow Wing Canoe Trail, RC&D project	123
Camp Salemen for Boy Scouts	189	West Central RC&D unique features	129
native grass on marshland	279	Mississippi—	
Negroes invented a mechanical sugarcane planter	233	Chewalla Lake first reservoir in Southeast developed for multipurposes on national forest land	198
parish police juries authority to contract for, etc., watershed projects	207	creeping bluestem, Coffeeville Plant Materials Center	106
recreation on Rocky Ford Branch	254	Delta Ministry enlisting programs to obtain equal economic opportunity	220
ricelands wildlife paradise	173	minister converts rundown land into garden spot	232
Lumber Is Our Crop. C. M. Henninger	53-55		
Maine—			
landscaper used to sod waterways	113		
minimum tillage for potatoes	103		
Management, Good. D. A. Williams	143		
MANDER, JIM: Iowa Farmers Find Self Help Pays Off	141		
Manderfield, Hubert, strip crops (Idaho)	105		



	Page		Page
Missouri—		New Mexico—Continued	
nursery fields not covered with trees seeded to grass and legumes for cattle.....	116	Northern Rio Grande RC&D unique features .....	129-130
State Highway Department realizes erosion and drainage control good investments..	43	northern, a trouble spot.....	244
Montana—		Newnham, Lyn, receives Wildlife Conservation Award (Ohio).....	185
Clark Fork, small timber.....	59	New York—	
Grange Conservation Tour.....	186	Appalachia Act extended to.....	221
gullies plugged by Christmas trees.....	154	conservation plan for school playground....	39
1964 flood from mountainous region.....	41	Ischua Creek watershed, recreation and wildlife opportunities.....	75-76
Plant Materials Center concentrating on ecotypes.....	58	nature trail on Belknap farm.....	177
rancher developing floodwater—spreading systems .....	261	outdoor laboratory.....	185
MOORE, CLARK L.: Monterey Pines Make Good Christmas Trees.....	117	Senior High School, 130 acres includes outdoor education.....	187
MOORE, HOMER C.: Pasture-Hay Program Makes Dairy Farm Pay.....	285	three-man team represented SCS in Boy Scouts .....	86
Moravia Students Learn Conservation on School Farm.....	185-186	New Zealand soil and water problems.....	167
Mouton, Raymond, grazes on marshland (La.) .....	279	NICHOL, HENRY F.: Land and Water Conservation Fund Can Aid Local Recreation Plans .....	161-162
Multipurpose Reservoir and Land Treatment .....	216	NORRIS, JOE B.: Land Treatment Gets Emphasis .....	118
MYERS, ROBERT E.: Watershed Wildlife. With Homer E. Stennett.....	75-76	North Carolina—	
Narrow Strips, Grass Cover Win Favor With Farmers. Walter J. Guernsey.....	160-161	Appalachia .....	221
National Audubon Society.....	92	Biltmore became site of first forestry school in America.....	47
Natural History Societies—John Vosburgh and Shirley A. Briggs.....	92-93	Nursery Alternates Trees and Cattle in Same Fields. William H. Billings and B. H. Rountree .....	116
Nebraska—		NYLANDER, PAUL E.: Behind the Scenes on a Watershed Construction Job.....	202-206
Bowman-Spring Branch, scene of reducing silt threat.....	68	OERTEL, ROBERT W.: A Look at Appalachia—The Program.....	270-271
Custer County, leading church layman focal point for resource development.....	219	OGLE, CLAYTON: Water Spreading Gives Rancher Use of Rainfall.....	261
Lincoln, Regional Technical Center.....	23	O'HAYRE, JOHN: Rancher Makes Showplace on Private, Public Land. With Edwin P. Engle .....	159
Scotts Bluff District developed a conservation irrigation farm.....	234	Ohio—	
Negroes—		Agency Gives Wildlife Award. Adrian Achtermann .....	185
Anna Strong and Carthelia Jordan receive awards from essay contests (Ark.).....	42	Air Pollution Department estimated tons of red dust settled on Cincinnati.....	248
given assistance, Sunset Community (Ark.) invented a mechanical sugarcane planter (La.) .....	233	Appalachia .....	221
operate farms in part of Johnson Creek watershed (Tenn.).....	251	Colerain Senior High School, 58 acres includes outdoor education.....	187
NELMS, W. C.: Minister Builds Farm and Church .....	232	Conservation District Aids Water Development. Willis J. Ridenour.....	66
NEUBAUER, T. A.: Review of Natural Resources for U.S. Growth.....	190	Holderman ditch problem.....	14
Never Summer Ranch Is Favorite Summering Spot. Robert W. Woods.....	202	minister spearheaded manpower development and training.....	220
New Hampshire farmers and new landowners spend more time on wildlife preservation..	183	plow-planting .....	105
New Jersey—		strip-mining, Avondale area.....	77
outdoor laboratory of school.....	82	woodland contractor.....	280
Silver Lake-Locust Island Project first of its kind in.....	179	youth wins FFA award.....	141
New Mexico—		Oklahoma—	
Ghost Ranch Museum.....	78-81	Eldred Sasseen. District Profile.....	237-238
Northern Rio Grande RC&D project.....	131	Nolen J. Fuqua. District Profile.....	164-165
		OLIVER, WILLIAM B.: A Shock to Alaska Agriculture .....	30-31



Oregon—	Page	PLAIR, T. B.—	Page
conservation per-animal leasing for Pilot Rock Division.....	209	Key Goals for Conservation.....	51-52, 68
Plant Center, grass and legume in alternate rows .....	7	Review of "Man and Land in the United States" .....	166
Portland, Regional Technical Center.....	23	Plant(ing, s)—	
Skipanon River watershed tidewater barrier included a barn-door tidegate for fish....	172	conservation, Dulles Airport. Cover picture (Va.) .....	[26]
Upper Williamette RC&D unique features....	130	in West, Russian-Olive Is Prize Landscape. Olan W. Dillon, Jr.....	231-232
OSBORN, BEN O.—		materials progress in 1964.....	139
Review of "Approved Practices in Soil Conservation" .....	69-70	New Conservation, in the West. L. A. Hafenrichter .....	6-8
Review of "Conserving American Resources" .....	46	shrub lespedezas, japonica and bicolor for utility rights-of-way (S.C.).....	11
Review of "Handbook of Applied Hydrology" .....	214	Playground Problems, Solving Part of District Program. George S. Brown.....	39-40
Review of "Land and Water for Recreation" .....	22	Plow(s)—	
Review of "The Economic Demand for Irrigated Acreage".....	286	Chisel, Reduces Erosion. Robert V. Bollman and Ernest E. Behn.....	105
Outdoor(s)—		Planting for Fewest Trips. John Battles....	105
Laboratories, Larger School Properties Provide for.....	187	Police Juries Boost Small Watershed Activity. J. B. Earle.....	207-208
Laboratory Builds Interest in All Studies. Erling W. Clausen.....	S2-83	POMEROY, KENNETH B.: American Forestry Association Sponsors Multiple Use, Conservation .....	67
Learning, Room for.....	192	Pond(s)—	
Outdoor Recreation, Bureau of, administers the Land and Water Conservation Fund Act .....	161	Farm, Serves Fire Protection and Recreation. Lenn Dompier.....	19
Ozarks, a trouble spot.....	244	Fish in Puerto Rico.....	57
		Is a Place of Many Delights. George Kinder .....	197
Pampered Stream Responds With Beauty and Utility. John Cross and Jimmie Wyche .....	254	Sinkhole, Provide Water in Limestone Area .....	115
PARTAIN, LLOYD E.: Review of "Waterfowl Tomorrow" .....	142	POPE, ARTHUR W.: Grass Seeding Pays Off on Kansas Estate.....	284-285
Pasture-Hay Program Makes Dairy Farm Pay. Homer C. Moore.....	285	Population—	
Paulson, Arthur, cleared first ski runs.....	55	exodus from Appalachia after World War II (W. Va.) .....	272
PEEPLES, GEORGE R.: A Conservation Plan for County Roadsides .....	163	exodus in Appalachia rapid since World War II (Ky.) .....	282
Pelley, Donald, Estel, and Jim use gradient ditches (Colo.) .....	281	PORTER, HAROLD B.: Farmland to Recreation and Homes.....	212
Pennsylvania—		PORTER, RICHARD: Pleasure and Profit From Ranch Resources. With Willis Hammond and R. D. Anderson.....	240
Appalachia .....	221	Profile, District—	
Boy Scout Jamboree.....	84	Francis E. Cox of S.C.....	21-22
conservation photo (Pa.). Cover picture....	[266]	Irwin Davis of Georgia.....	260-261
Muddy Creek. Cover picture.....	[266]	Nolen J. Fuqua of Oklahoma.....	164-165
Penn Soil RC&D unique features.....	130	Monroe Samuel of Arkansas. Lawrence W. Compton .....	69
Two-man teams represented SCS in Boy Scouts Jamboree.....	86	Eldred Sasseen of Oklahoma.....	237-238
Upper Darby, Regional Technical Center....	23	Puerto Rico fish pond.....	57
personnel progress, 1964.....	140		
pesticides menace from duststorms.....	249	Ranch Resources, Pleasure and Profit. Willis Hammond, Richard Porter, and R. D. Anderson .....	240
Pheasant Hospitality Association Welcomes Hunters to Plains. Thomas J. Skillman....	178	Rancher Makes Showplace on Private, Public Land. Edwin P. Engle and John O'Hayre....	159
Pigorsh, Sheriff Arnold, originator of minimum security project (Mich.) .....	223	Range—	
Pines Like Money in Bank for Banker-Farmer .....	201-202	Conservation, New Zealand Lessons. D. A. Williams .....	167
Pines, Planted Are Major Crop on Plantation .....	72	conservation progress in 1964.....	139



Range—Continued	Page	Recreation—Continued	Page
forage, Lana vetch.....	152	Yuma Pheasant Hospitality Association	
land revegetated.....	68	(Colo.) .....	178
Pilot Rock, Cunha Tract, land leasing.....	210	Rellers, George, Glenn, and Dale build saw	
rehabilitation on private and public land		mill (Mont.).....	59
(Colo.) .....	159	Resource Conservation and Development—	
surveys, new system.....	147	helped by churches.....	219-220
Rate of Practice Application Gains in Great		project(s)—	
Plains .....	109	Awakens Area, Northern Rio Grande.	
RAY, MERRILL D.: Brady's Hills Ski Area.		Richard B. Bowen.....	131-132
With James M. Cooper.....	55-57	Crow Wing Canoe Trail (Minn.).....	123
RECHENTHIN, C. A.: The Texas Brush Prob-		designated .....	133
lem. With H. N. Smith.....	150-152	First 10, Show Scope of Activities.....	129-130
Reclamation, Bureau of, San Juan-Chama		White River (Vt.).....	126
Project .....	132	White River (Vt.). Cover picture.....	[122]
Recreation—		Resource Development, Opportunities in.	
and—		John W. Barnard.....	127-128
grazing profitable on ranch (Colo.)....	240	resource team approach (Mass.).....	29
hunting area bought by Negro business-		Reviews—	
men and farmers, Johnson Creek		Approved Practices in Soil Conservation.	
(Tenn.) .....	252	By Albert B. Foster.....	69-70
Livestock Make Happy Combination.		Conservation in People's Hands. By AASA	
Gilbert F. Schwandt.....	288	Commission on Conservation.....	22
wildlife, Ischua Creek Watershed (N.Y.)..	75-76	Conserving American Resources. By Ruben	
Annual Youth Camp to study natural re-		L. Parson.....	46
sources (Ariz.).....	175	The Economic Demand for Irrigated Acre-	
areas, Northern Rio Grande RC&D Project		age. By Vernon W. Ruttan.....	286
(N. Mex.).....	132	Farmer's World. The Yearbook of Agri-	
bonus on Bayou Rapides and Bayou Boeuf		culture .....	118
watersheds (La.).....	207	Forage Plant Physiology and Soil-Range	
Crow Wing Canoe Trail, RC&D project		Relationships. R. E. Williams.....	262
(Minn.) .....	123	Handbook of Applied Hydrology. Edited by	
from Horse Pen Run's single flood-retarding		Ven Le Chow.....	214
structure, Dulles (Va.).....	38	Land and Water for Recreation. By Marion	
homes, lake, and golf course constructed		Clawson .....	22
on farmland (Wis.).....	212	Man and Land in the United States. By	
hunters paid to use Lana vetch field.....	153	Marion Clawson.....	166
in Appalachia (W. Va.).....	272	Natural Resources for U.S. Growth. By	
income-producing enterprises progress,		Hans H. Landsberg.....	190
1964 .....	134	Planning Our Town. By Martha E. Man-	
Mud River watershed (Ky.).....	9	zer .....	214
nature trail joint farm effort of Belknap		Tomorrow's Wilderness. Edited by Fran-	
and gun club (N.Y.).....	177	cois Leydet.....	69
Never Summer Ranch, horseback riding,		Waterfowl Tomorrow. Edited by Joseph	
hiking, fishing (Colo.).....	202	Linduska .....	142
on private land provided by Land and		Wildlife Management and Conservation.	
Water Conservation Act.....	162	By James B. Trefethen.....	190
on Rocky Fork Branch (La.).....	254	World Prospect for Natural Resources.	
opportunities improved by tree planting...	52	By Joseph L. Fisher.....	238
pond stocked with fish.....	19	Riceland Wildlife Habitat. Carl H. Thomas..	173-174
ponds, Lazy 6 Lakes (Ill.).....	16	RIDENOUR, WILLIS J.: Conservation District	
Quality in Outdoor. Frank C. Edminister..	87	Aids Water Development.....	66
sites preserved by private enterprise		RIECKEN, F. F.: Soil Survey Use in Iowa.	
(Calif.) .....	32	With W. D. Shrader.....	109-110
ski runs supplement farm income (Mich.)..	55	Riser, Louis, Jr., plow planting (Ohio)....	105
South River subwatershed of Potomac.		river basin surveys, progress in 1964.....	135-136
Cover picture.....	[194]	ROSS, ROBERT L.: Christmas Trees Make	
summer-day camp and horseback riding on		Gully Plugs.....	154
grassland farm (Md.).....	276	ROTH, BERNHARD A.: Airport Conservation	
Sunset Community Rural Areas Develop-		Makes Good Neighbor.....	36-39
ment (Ark.).....	13	ROUNTREE, B. H.: Nursery Alternates Trees	
swimming area on Lime Lake (Mich.)....	18	and Cattle in Same Fields. With William	
		H. Billings.....	116



	Page		Page
ROY, CLIFFORD: Minimum Tillage for Potatoes. With William A. Hayes-----	103-104	SKILLMAN, THOMAS J.: Pheasant Hospitality Association Welcomes Hunters to Plains---	178
runoff rate reduced by land use practices----	196	Sloss, James P., range rehabilitation on private and public land (Colo.)-----	159
Rural—		Small Business Administration loan for sawmill (Mont.)-----	59
and urban working together (Mass.)-----	45	SMITH, DWAIN C.: A Modern Cattle Drive. With Herbert R. Davis-----	155-158
community revives its economy (Tenn.)--	251-253	SMITH, H. GRANVILLE. Spoilbanks and Bird-life -----	77
poverty alleviated by use of soil and water resources -----	119	SMITH, H. N.: The Texas Brush Problem. With C. A. Rechenthin-----	150-152
Rural Areas—		SNIDE, M. J.: State Highway Construction and Soil and Water Conservation-----	43-44
Attract Birds and Other Wildlife to. Roy A. Grizzell and Verne E. Davison-----	88-89	sodding waterway mechanically-----	113-114
Crow Wing Canoe Trail, RC&D project (Minn.) -----	123	Soil(s)—	
Development—		and water conservation plan accepted by Dulles' builders (Va.)-----	38
associations sponsor RC&D project (N. Mex.)-----	130	and Water Conservation and Resource Development -----	133-140
associations sponsored RC&D project (N. Mex.) -----	131	Conservation in Alaska. Michael D. Hill--	33-35
by police juries for Bayou Rapides and Boeuf watersheds (La.)-----	207-208	Display Boards Aid "Know Your Soil" Campaign. Luther E. Gowder and James A. Cotton -----	256
by Roanoke Creek watershed (Miss.)----	199	Erosion in Urban Areas. Verne M. Bathurst -----	274-275
Committees important in stimulating RC&D projects-----	128	Information for Woodland Planning. Paul E. Lemmon-----	63-64
in Sunset Community (Ark.)-----	12-13	New Classification. E. Joseph Larson-----	99-102
movement contributed to by churches----	219	Soil Conservation District(s)—	
Mud River watershed (Ark.)-----	9-11	almost all of Negro farms were cooperating with (Tenn.)-----	251
watershed project for recreation, Holly Springs (Miss.)-----	198	broadened to conservation (Mass.)-----	27
economy built up by woodlands, Clark Fork (Mont.) -----	59-62	Builds Woodland Economy-----	59-62
White River Resource Conservation and Development Project (Vt.)-----	126	Buys and Restores Farm to Demonstrate Good Practices. R. H. Boecking-----	234-235
Rural Areas Development, Office of, participates in RC&D activities-----	127	completion of subdistrict spurred by earthquake (Alaska)-----	30
Rural Electrification Administration, loan for sawmill (Mont.)-----	59	create new wealth in rural and urban America -----	215
participates in RC&D activities-----	127	Flathead, furnished instructors for Grange Conservation Tour (Mont.)-----	186
RUSH, RICHARD W.: Agencies, Landowners Join Efforts to Improve Ditch. With William F. Brown-----	14	Greene County conducts "Know Your Soil" campaign (Ala.)-----	256
		have taken the lead at local level in developing leadership in RC&D projects----	127
Sagebrush Gives Way to Tall Grass. John K. Hortin-----	144	helped in water velocity problem (Mo.)----	44
Salmon and Steelhead, Hope for. L. Dean Marriage -----	171-173	helps double water development projects (Ohio) -----	66
SCHWANDT, GILBERT F.: Recreation and Livestock Make Happy Combination-----	288	Lee County, controls artesian wells (Fla.)--	257-258
Security of Johnson Creek-----	251-253	made strides in woodland conservation-----	71
Sediment—		may qualify for grants-in-aid from land and water conservation fund-----	161
The Cost of. D. A. Williams-----	287	one organized in Alaska-----	33
deposition reduced by land treatment measures -----	196	program for assistance of all landowners, not farmers alone-----	39
discharge in Potomac River Basin-----	274-275	progress for 1964-----	134
Threat Stirs Landowners. Richard D. Jiskra and Harry W. Bell-----	68	provided technical guidance by SCS on practices that improve wildlife habitats -----	191
seed patch program to raise Negro living standards (Tenn.)-----	251		
shaft-mining (Ill.)-----	154		
SHIFLET, THOMAS N.: Grazing Native Grass Proves Conservation Use of Fresh Marsh--	279		
SHRADER, W. D.: Soil Survey Use in Iowa. With F. F. Riecken-----	109-110		



Soil Conservation District (s)—Continued	Page	Soil Survey (s)—Continued	Page
sought evaluation of Dulles' impact on scientific land use planning (Va.)-----	37	used in home, lake, and golf course construction (Wis.)-----	212
State in lead to modernize its districts' functions (Ark.)-----	258	Use in Iowa. W. D. Shrader and F. F. Riecken-----	109-110
supervisors expect Appalachian Regional Development Act to speed up program (Ga.)-----	270	will start using new soil classification-----	99
will join others in making plans to use provisions of Appalachian Act-----	267	SORENSEN, LAWRENCE W.: A Half Century of Stripcropping-----	105
Soil Conservation Magazine marks 30th anniversary-----	212	South Carolina-----	221
Soil Conservation Service-----		Appalachia-----	201
and Magazine Mark 30th Anniversary-----	212	banker-farmer gets cash income from crop of trees-----	21-22
assists landowner make inventory of his range resources (Colo.)-----	159	Francis E. Cox, District Profile-----	111
charged with guiding recreation development on private land-----	87	Grass important part in highway construction-----	72
combined with others on Boy Scout Jamboree-----	84	Sunnyhill Plantation, 10,000 acres of pines--	
designated to administer RC&D project activities-----	127	South Dakota-----	155
developed a new type of technician--the soil conservationist-----	244	cattle drive by Roy Houck-----	19
furnished technical assistant to Sunset Community (Ark.)-----	13	Eagle Scout receives Hornaday Award-----	235
Goes Abroad. Edward H. Graham-----	3-5, 20	experimental plot of 30 grass varieties-----	[146]
gains in management value-----	143	Ray Houck trail drive. Cover picture-----	130
had a hand in Lana's development-----	152	RC&D unique features-----	255-256
Has Unofficial Role Under Economic Opportunity Act-----	189	sportsman has ducks and geese year-round--	236
helped in water velocity problem (Mo.)-----	44	Spitzer, Alvin, completed all steps of conservation plan (N. Dak.)-----	77
Helps Repair Land Damaged by Montana Flood. P. E. Farnes-----	41	Spoilbanks and Birdlife. H. Granville Smith--	255-256
made and interpreted soil surveys Clark Fork (Mont.)-----	59	Sportsman Makes Wildlife Haven of His South Dakota Farm. Robert O. Koerner--	96
prepared plans based on soil survey for many school sites (Mich.)-----	187	Springs Solve Water Problem-----	188
progress for fiscal 1964-----	137-139	State Reformatory Is Site of Unique Pipeline. A. G. Crook-----	75-76
provides assistance on woodland aspects of conservation farm plan-----	71	STENNETT, HOMER E.: Watershed Wildlife. With Robert E. Myers-----	17
Range Surveys-----	147-149, 162	Stephens, Sidney O., domain conservation showplace (Mich.)-----	105
Rate of Progress in Programs Shows Increase in Fiscal 1964-----	93	Stripcropping-----	160
responsibility to landowners never ends-----	68	A Half Century. Lawrence W. Sorensen--	77
Services To Urban Areas. D. A. Williams--	47	narrow tobacco strips in fields (Ky.)-----	12-13
Soil Stewardship-----		strip-mining, Ohio Power Co-----	119
and Growth. D. A. Williams-----	239	Sunset Community, New Hope for. Otis Thompson-----	23
churches help Resource Conservation and Development-----	219-220	Tennessee-----	32
Clubs and Schools Join Churches in. Charles H. Harper-----	226	Appalachia-----	221
Jewish farmers instituted the Seventh Year-----	220	Community School Provides a Study in Conservation at Work. E. B. Dyer-----	283-284
minister builds farm and church (Miss.)--	232	cropland reduced by PL-566 projects-----	196
Soil Survey (s)-----		Johnson Creek, rural community pulling itself out of category of depressed area-----	251
an SCS program containing nonagricultural benefits-----	47	pine and hardwood trees-----	53
detailed maps greatest demand (Alaska)-----	34	SCS retiree becomes full-time conservation farmer-----	285
information for many school sites (Mich.)-----	187	Texas-----	
map showed 11 farmers would benefit from drainage (Ohio)-----	14	Brush Problem. H. N. Smith and C. A. Rechenthin-----	150-152
shaft-mining land (Ill.)-----	154	fawn. Cover picture-----	[170]
		Ft. Worth Examining Board-----	140
		Ft. Worth Regional Technical Center-----	23
		grasslands a trouble spot-----	244



Texas—Continued	Page	Virginia—Continued	Page
Kent Creek Watershed, land treatment measures .....	118	skilled management of soil and water, Dulles International Airport.....	36
student yearbook.....	173-174	waterproofing pasture sinkholes.....	115
THOMPSON, OTIS: New Hope for Sunset Community .....	12-13	VOSBURGH, JOHN: Natural History Societies. With Shirley A. Briggs.....	92-93
Through the Centuries. Rabbi Eugene J. Lipman .....	220	Wangsgard, Robert, pioneer in control of sagebrush (Utah).....	144
trail drive (S. Dak.). Cover picture.....	[146]	Washington—	
transportation breakdown by earthquake.....	31	fire protection pond.....	19
Tree(s)—		harvest time, Palouse. Cover picture.....	[1]
buffer belt of forest at Dulles (Va.).....	38	Palouse area trouble spot.....	244
Christmas, Make Gully Plugs. Robert L. Ross .....	154	Plant Center spotted Latar orchardgrass....	8
field windbreaks and wildlife plantings along interstate highway (N. Dak.).....	225	Spokane Co., RC&D unique features.....	130
loblolly pines give cash income (S.C.).....	201-202	Water—	
Monterey Pines Make Good Christmas. Clark L. Moore.....	117	development projects given priority by SCD (Ohio) .....	66
on one side of nursery, cattle on other.....	116	Leveling in Korea.....	67
Planted on Shaft Mining Land. Silas W. Brown .....	154	More Business.....	199-201
planting chore Scouts remember (Mich.)....	17	municipal, storage in Appalachia (Ga.).....	270
planting on private land resulted in changes in land use.....	51	Spreading Gives Rancher Use of Rainfall. Clayton Ogle.....	261
planting program to raise Negro living standards (Tenn.).....	251	supplies in Appalachia.....	222
Russian-olive makes a fine shade.....	231	supply forecasting in 1964.....	140
willows, poplars, elms trail plantings.....	65	waste from artesian wells controlled (Fla.) .....	257
Tunisia—		Year, 1964, Varies in West.....	141
operations by SCS, 1964.....	140	Watershed(s)—	
SCS assisting government program.....	3	American Fork-Dry Creek basin seeded by Boy Scouts (Utah).....	211
TURELLE, J. W.: Wind Erosion Control Guides .....	107-109	Big Park overcomes flood and erosion problems (Iowa).....	141
Unfinished Job. J. C. Dykes.....	243-245	Birch Creek, protection plan before flood....	41
Urban(ization)—		Bonds Creek provides protection and recreation (W. Va.).....	273
caused sediment.....	287	Bowman-Spring Branch scene of reducing silt in new floodwater dams (Nebr.).....	68
sedimentation problems.....	275	Chewalla Lake, recreation on national forest land, Holly Springs (Miss.).....	198
sprawl near every great metropolitan center .....	244	Chippewa River tributaries and Hawk Creek floodway (Minn.).....	15
through conservation districts (Mass.).....	27-29, 45	Construction Job, Behind the Scenes. Paul E. Nylander.....	202-206
Utah—		80 approved for Appalachia.....	222
Boy Scouts seeded basin, American Fork-Dry Creek watershed.....	211	Horse Pen Run embraced by Dulles project .....	38
rancher pioneer in control of sagebrush....	144	in Appalachia (Ga.).....	270
VAN BERKOM, LARRY: Conservation Plan Converts Cropland to Grass.....	236	Johnson Creek, program to raise Negro living standards (Tenn.).....	251
VANDERGRIFF, DONALD E.: Taming Wild Wells in Florida.....	257-258	Kent Creek, land treatment measures (Tex.) .....	118
Vermont—		land treatment comes first.....	215
White River RC&D unique features.....	130	Land Treatment. John H. Wetzel.....	195-197
White River RC&D project. Cover picture..	[122]	Little River subwatershed of Coosa River, vegetation on roadbanks (Ga.).....	163
White River Resource Conservation and Development .....	126	Millcreek, diary of the SCS engineer.....	203-206
Virginia—		Mud River.....	9-11
Appalachia .....	221	Muddy Creek, conservation practices (Pa.) Cover picture.....	[266]
Dulles Airport. Cover picture.....	[26]	Oued Marguellil, Tunisia.....	3
Lake Barcroft, urbanization more abrupt..	275	people voted tax to run Bayou Rapides and Bayou Boeuf (La.).....	207
recreation, Brookfield Park. Cover picture..	[75]		
Roanoke Creek watershed, pumps part of municipal water supply system.....	199		



Watershed(s)—Continued	Page	Wildlife—Continued	Page
planning and operations, 1964.....	134-135	Russian-olive attracts birds.....	231
program given new life to towns and cities by curbing floods.....	47	soil interpretation system for wildlife in Northeast applied to Corn Belt and Great Plains .....	139
program sparked interest in conservation... 52			
Project Turns the Tide, at Hancock Bridge .....	179-182	WILLIAMS, D. A.—	
Roanoke Creek will provide additional multiple-use benefits.....	199	The Challenge of Appalachia.....	263
Skipanon River tidewater barrier included a barn-door tidegate for fish (Oreg.)....	172	Civil Rights Act, Rural Beauty.....	95
Tongue River, Renwick Dam and lake pro- vide recreation, flood protection (N. Dak.) .....	259	The Cost of Sediment.....	287
Twelve Mile Creek (S.C.).....	11	Farm Game—Conservation Districts—Wild- life .....	191
under complete conservation treatment (Md.). Cover picture.....	[218]	Good Management.....	143
Wildlife. Robert E. Myers and Homer E. Stennett .....	75-76	Great Society, Technical Guides, Keeping Up .....	119
Waterway Problem, Mechanical Sodding Method Solves. Larry H. Long.....	113-114	Land Treatment—What Districts Do.....	215
West Virginia—		Range Conservation, New Zealand.....	167
Appalachia .....	221	SCS Services to Urban Areas.....	47
ebb and flow of people and prosperity in Appalachia .....	271-273	Stewardship and Growth.....	239
local pastor helped organize Braxton County Development Corporation Committee....	220	Technical Service Centers.....	23
WETZEL, JOHN H.: Watershed Land Treat- ment .....	195-197	Woodlands in the Conservation Program....	71
What Do Retired Conservationists Do? T. F. Jones .....	285	WILLIAMS, R. E.: Review of Forage Plant Physiology and Soil-Range Relationships..	262
White River Area, Life for. Eugene C. Hanchett .....	126	WILLIAMSON, E. J.: New Award Program Supports 4-H-Club Conservation Project..	81
Wildlife—		Windbreak(s)—	
and recreation, Ishua Creek watershed (N.Y.) .....	75-76	along interstate highway (N. Dak.).....	225
areas protected on retiree farm (Tenn.)...	285	Field, Patterns Protect Irrigated Sand.....	65
as important as farming business (S. Dak.) .....	255	widely used practice.....	51
bicolor for (S.C.).....	11	Wind Erosion—	
Conservation Award given to Lyn Newn- ham .....	185	Control Guides. J. W. Turelle.....	107-109
fawn (Tex.). Cover picture .....	[170]	major problem in Saleha-Big Delta sub- district (Alaska).....	35
food, cover, and other attractions.....	88-89	showed damage in Texas.....	248
food, Lana vetch.....	152	Wingfield, George W., pays to reseed sub- marginal cropland to grass (Colo.).....	168
from reclamation of strip-mining, Avondale area (Ohio).....	77	Wisconsin—	
habitat preservation.....	52	exact soil profiles.....	86
has many values for many people.....	191	Pri-Ru-Ta RC&D unique features.....	130
hunters kept by farmers (Colo.).....	178	transformation of farmland to recreation..	212
new landowners landscaped home for wild- life preservation (N.H.).....	183	water and windbreaks winning combina- tion .....	65
plantings along interstate highway (N. Dak.) .....	225	woodlands. Cover picture.....	[51]
plantings on nature trail by Turnpike Rod and Gun Club (N.Y.).....	177	Woodland(s)—	
return of profitable muskrat trappings at Hancock Bridge (N.J.).....	180	as a land use major part in Appalachia (Ky.) .....	282
ricelands offer a variety of alternatives for wildlife conservation (La.).....	173	built economy, Clark Fork (Mont.).....	59-62
		conservation land use. Cover picture (Wis.) .....	[51]
		conservation progress in 1964.....	139
		contracting work (Ohio).....	280
		industries developing in Appalachia (W. Va.) .....	273
		in the Conservation Program. D. A. Williams .....	71
		in ski area (Mich.).....	55
		produced profitable lumber (Tenn.).....	53
		suitability of soils determined.....	63
		WOODS, ROBERT W.: Never Summer Ranch Is Favorite Summering Spot.....	202



WORTHINGTON, ELMER L.: Farmers Plant Trees to Beautify New Interstate Highway Route -----	Page 225-226	YOUNG, GLADWIN E.— Preservation of Natural Beauty-----	Page 165
WYCHE, JIMMIE: Pampered Stream Responds With Beauty and Utility. With John M. Cross -----	254	Review of "Conservation—in the People's Hands" -----	22
Wyoming gravity-flow sprinkler system-----	90	Review of "World Prospects for Natural Resources" -----	238
Yearbook Honors Conservationists-----	102	YOUNG, W. C.: New Grasses for the South- east. With H. L. Leithead-----	106-107
		Youth Conservation Camp. Danny Freeman--	175-176















